AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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GLIMPSES OF THE SUGAR BUSH.

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THE MAPLE-SUGAR INDUSTRY OF VERMONT.

JOHN E. GALE.

EVAPORATION of the sap of the rock or sugar maple, for use as an article of diet, has been practiced by denizens of the north temperate zone from time immemorial. The North American Indian, long before the discovery of the continent by Europeans, hacked the maple with his stone hatchet, and guided the trickling sap in spouts of bark into a sort of rude tank made from a log hollowed out by fire and scraped with sharp stones. By putting heated stones into his tank of sap, the Indian was enabled to produce a substance which was undoubtedly nectar to the benighted savage, but which would seem like tar when compared with the amber-colored syrup from one of our modern sap evaporators. The Europeans brought with them kettles of iron and brass, and in these they slowly and with infinite waste of labor and fuel, reduced the maple sap to molasses and sugar. Iron kettles were used for over fifty years, when they were superseded by large, shallow, rectangular pans of sheet iron, which were set in arches of brick or stone, and gave a wonderful impetus to the sugar-making industry. Soon after the pan came the "heater," a sort of boiler made of tin, with flues through the lower part, through which the fire was made to pass on its way to the chimney. By this arrangement a stream of cold sap was continually running into the heater from the store tubs, and a corresponding stream of boiling hot sap flowing from the heater into the pan; thus the boiling of the sap in the pan was not retarded by the turning in of cold sap. By the pan and heater process a most excellent product was obtained, and many sugar makers still make use of apparatus of this kind; but the still more modern sap evaporator has found its way into nearly every large sugar orchard in the country. The evaporator is made of tin, copper, or galvanized iron, and is so constructed that the sap flows in at one end and, by means of partitions extending nearly across the pan, is made to take a zigzag course to the other end, where it is drawn off as syrup. The sap in the pan is kept shallow—about one-half inch in depth—and evaporates very rapidly. Rapidity of evaporation is greatly to be desired, not only on the score of economy of time, but because the sooner sap is converted into syrup after it runs from the tree the lighter will be the color and the finer the flavor of the syrup and sugar.

The season of maple sugar making is in the early spring, opening usually about March 10th, and continuing three or four weeks, according to the weather. Sap will run only when the temperature is at least thirty-two degrees F., and stops flowing as soon as frost is out of the ground, or directly after the snow is gone. As soon as the weather is favorable the maples are tapped by boring the stems with a small bit—usually half-inch—about one and one-half inches deep, and from one to three feet above the ground. Trees are not tapped until they are about one foot in diameter. After tapping, a spout made of clean maple, beech, tin or galvanized iron, and fitted with a hanger for holding the bucket, is driven firmly into the hole made by the bit; a bucket of wood or tin is hung upon the spout, and the tapping process is finished. Only one hole is bored in young trees, but I have seen as many as half a dozen buckets, with two spouts each, hung to maples of large size. If the bucket fills with sap in a day the run is a good one, although twice this amount is often obtained in exceptionally favorable sap days.

A barrel of good sap will make a gallon of syrup or eight pounds of sugar. After being reduced to syrup in the evaporator, the product is allowed to cool and settle, more or less of impurities being precipitated by standing. The syrup is now ready for putting into cans for sale, the size most in use being one gallon. The proper consistency of syrup is generally conceded to be eleven pounds to the gallon, and this degree of density is reached at 219° Fahrenheit. If wanted for sugar, the boiling is continued until the thermometer indicates 232° for pail sugar, or 238° for cakes, when the mass is removed from the fire, stirred briskly for a short time, and then poured into tin pails or cake molds, as the case may be, to harden. Pail sugar retains its flavor better and does not become hard and flinty, as cake sugar does. It does not require so much boiling, costs less than the latter, and is much nicer for household use. Cake sugar is good only when first made, as it not only loses its fine flavor, but becomes almost as hard as rock itself after standing a few weeks.

Prices vary with the seasons and the quality of the article; good pail sugar being usually worth from ten to twelve cents, and choice cakes from fourteen to eighteen cents per pound in the home markets, with syrup from seventy-five cents to one dollar per gallon, with sometimes lower prices for off grades. The amount of sugar that a single tree produces in one season is about three and one-half pounds for the average sugar orchard. Tapping the tree does not impair its vitality to any appreciable degree, and the holes usually close with the growth of the tree in about three years. The maple tree often lives to be upwards of one hundred years old, its wood is exceedingly hard, and is valued next to coal as fuel.

The census of 1890 found fourteen thousand sugar makers in Vermont, producing annually about sixteen million pounds of sugar or its equivalent in syrup. Since the removal of the tariff on cane sugar, a portion of the maple sugar makers of Vermont have availed themselves of the government bounty of one and three-fourths, and two cents per pound. The amount received from this source would be greatly augmented if it were not for the exclusion of those producing less than five hundred pounds per year, and the fact that all syrup is barred and pail sugar cannot be brought up to the required standard—eighty per cent. pure sugar—without cooking it so hard as to destroy its market value. The pure product of the maple is hard to find in the city markets, as jobbers adulterate both sugar and syrup with glucose and cane sugar until the compound could not be recognized by a Vermonter, whose State has enacted laws providing severe penalties for any adulteration of her maple products. The sugar season comes at a time when the farmer could not profitably employ his time otherwise, and taken all in all the sugar industry is one of the most remunerative sources of income of the Green Mountain State. [Our frontispiece, engraved after photographs furnished by Mr. Joseph Miller, shows the hauling of the sap, the evaporator, and the molding of the sugar bricks.]

COST OF WHEAT-GROWING.

J. R. DODGE.

If former statements of wheat growers are correct, much of the last crop was grown at a positive loss. The export price for the last fiscal year was a fraction less than eighty cents, the average farm price only sixty-two cents, while the average price in Nebraska was only fifty cents, in South Dakota fifty-one, North Dakota fifty-two at the nearest railway delivery, and at points remote from market scarcely forty or forty-five cents. It is not long since the growers in these districts declared that the crop would not pay the expense of cultivation at less than sixty cents. As the yield of this region was not much more than twelve bushels per acre, the gross proceeds were only about six dollars per acre. What sort of cultivation would this pay for, defray the expense of threshing and delivery, and meet the interest on the investment, to say nothing of profit? I will not here go into the details of cost, which vary so much with the condition of the soil, methods of culture, efficiency of teams, the implements used, and energy of management. If there are soils and treatment that give sixteen or more bushels, the compensation is greater, and probably the profit; but for the fields that yield only six to ten bushels, it is difficult to see how a loss could be avoided. Such prices, with the deterioration of soil resulting from continuous cropping, in disregard of rotation, must result in ultimate degradation of fertility and value.

Official investigation, by State authority, has been made of the cost of wheat-growing in Illinois, and comparisons made with the value of the crop. In some years a profit is declared, in others a loss. The cost, as reported, varies somewhat from year to year; rarely less than ten dollars per acre, often considerably more. The difference between New York and Dakota is not one of rate of wages, but of amount of labor. More cultivation is given, and the larger cost sometimes secures the better margin of profit. Further east the cost is still greater, the yield quite as good, and the profit possibly as large, from higher prices of grain and the value of the straw. In New England wheat may not be a profitable crop, and it is little grown in competition with the West, but the yields are

generally greater per acre than in the best wheat-growing regions of the prairies, because of the better cultivation and care of the crop.

In Great Britain, where land is held at several hundred dollars per acre, wheat is still grown, though not as extensively as formerly. It seems incredible that rent and tithes to an amount greater than the gross income of a Dakota wheat field could be paid by an English grower, and that other expenses should swell the cost of cultivation to an equivalent of thirty dollars per acre, and still making a profit while selling the crop at eighty-five cents per bushel. Yet I have such a statement from credible authority. The cultivation included two three-horse draggings, drilling, harrowing twice, and rolling in spring; cutting, carrying, threshing, winnowing and marketing were subsequent labors. The yield was forty bushels, price twenty-eight shillings ($7) per quarter of eight bushels, and the straw, one ton, ten hundred weight, brought two pounds ($8) per acre. The straw alone brought about as much as the entire crop is worth in Illinois. The lessons that these facts teach are thoroughness, high culture, rotation and sustained fertility. Slipshod husbandry never pays. Primitive methods are unprofitable. Makeshifts and temporary expedients may secure a small present profit at the expense of loss of fertility.

The exclusive wheat belt is receding. It is well that it is. Long since miscellaneous agriculture and horticulture took the place of exclusive wheat in Western New York. Twenty-five years ago one could scarcely find butter enough in Eastern Minnesota to grease a griddle, while the autumn nights were lighted with bonfires of thousands of tons of wheat straw, where now diversified production and plenty rule. Now there are counties in Southern Dakota where such a change has already been effected. Perhaps low prices will prove a Godsend to western agriculture, by driving exclusive wheat culture out of existence. Let wheat have a place in rotation, with twenty to thirty bushels per acre as a yield, but put labor to a better use than swelling a surplus product to the depression of prices. There is no need of growing wheat at a loss, where other products are demanded at fair prices, and it is unwise to persist in competing with half-price labor in Russia and the few cents per day competition of India. It is a perversity that nothing but hard times can cure. There is a conservatism that resents advice to quit unprofitable culture, as impertinent interference with one's right to do a foolish thing. If anything will cure the wheat craze, the present prices ought to suffice.

POTATO SCAB, ITS CAUSE AND REMEDY.

L. R. TAFT, MICHIGAN AGRICULTURAL EXPERIMENT STATION.

While the general appearance of the injury commonly known as "scab" upon the potato is familiar to every one, its cause has been for a long time, and is even now, a subject of controversy. It appears in all kinds of soil, in all seasons, upon all varieties, and under all methods of cultivation, but it has been noticed that it is more commonly prevalent in a mucky soil, or in a loam rich in decaying vegetable matter than in a poor, sandy or clay loam. In some seasons it seems more likely to occur than in others, while, as a rule, varieties with a thick skin are less injured than those having a thin epidermis. It has frequently happened that, in raising a crop, some condition is present that did not exist the previous or or subsequent year, and if there is a marked difference in the amount of scab in the two years, it is at once hailed as the cause, or as a preventive of scab, as the case may be. In addition to the effect of the conditions named above, a certain kind of manure, wood ashes, salt, lime, or a chemical fertilizer have often been charged with causing, or credited with preventing the disease. Various insects and other small animals have also been cited as responsible for the injury, and, while one man may be positive that the wire worm is the only cause, others are equally certain that with them the scab of the potato is produced by angleworms or "grubs," and a recent writer in an agricultural paper is positive that its appearance is due to the Colorado potato beetle.

What is known as potato scab is a rough, corky development upon the surface of potatoes, in some cases no larger than a pinhead, while in others it covers the entire tuber—generally forming a slight elevation, although it is depressed at the center in the form known as deep scab. It has long been understood that, whatever the cause of the disease, this rough, spongy mass was largely composed of a corky growth thrown out by the tuber to cover up and repair the injury produced by it. In soil where wire-worms are found it is not improbable that they may eat away the epidermis and cause a scabby formation, but one has only to examine potatoes at different times during their period of growth, and watch the development of the scab spots, to become convinced that neither wire-worms nor any similar organism is the cause of the true scab of the potato, even though they may be found feeding upon the scab spots and modifying their appearance. If it is to cause the scab the wire-worm must take an uninjured tuber and eat out enough of the epidermis to start the formation of the corky tissue, and the eating must be continued until the injured portion is nearly, if not quite as large, as the future scab spot is to be; but while at the time the tubers ripen the scab may be readily mistaken for their work, during the early stages of their development the spots have every indication that the epidermis has not been eaten away, as would be done by wire-worms. It is sufficient to say that much light has, within the past three years, been thrown upon the nature of this disease by the observations and experiments of Prof. H. L. Bolley of the North Dakota experiment station, and Prof. R. Thaxter of the Connecticut State experiment station. The evidence is conclusive that it is due to the development within the tissue of the potato of a parasite of a very low order. They found that they could readily inoculate a healthy tuber, or could render a scabby one innocuous. Some farmers claim that the use of seed potatoes that are free from scab will tend to produce a crop comparatively free, and that scabby seed will produce tubers that are badly affected, while others are equally positive that it makes no difference whether the seed potatoes are scabby or not upon the amount of scab in the crop.

The experiments of Prof. Bolley show conclusively that when seed perfectly free from scab is planted in new soil there will be no scab upon the crop, while in soil on which potatoes have been recently grown the same seed will produce tubers more or less covered with scab. He also found that by soaking the tubers in a solution of corrosive sublimate the germs were destroyed, and on virgin soil no scab appeared in the crop. To test the efficacy of this remedy it was tried at the Michigan experiment station among others in 1892, and the results were so favorable that a much more elaborate trial was undertaken in 1893, the experiments being planned and carried out by R. J. Coryell, assistant horticulturist. It having been ascertained that corrosive sublimate was an effectual remedy for scab, the proper strength of the solution and the duration of the treatment were next to be ascertained. In order to have it as conclusive as possible, two varieties of potatoes, the Early Ohio and O. K. Mammoth, the tubers of which were badly affected with scab, were selected, and each was divided into fifty-six lots of two pounds each. Ten lots of each variety were untreated, and were planted in check plots; twenty-four lots were soaked in a solution of one part of corrosive sublimate by weight in one thousand parts of water for periods varying from fifteen minutes to four hours; twenty-two other lots of each variety were soaked in a solution one-half as strong (1 to 2,000) for periods of from one-half hour to eight hours. Half of the above lots were planted upon soil where potatoes were grown in 1892, and the other half in new soil. In addition to the above, twenty-two other lots of the O. K. Mammoth were soaked in a somewhat stronger solution (1 to 750) for periods varying from five minutes to two and one-half hours, and were planted the same as the others. All of the plots received ordinary cultivation. As the plants vegetated it was noticed that the soaked sets were somewhat longer in appearing than those unsoaked, and that the difference was greater as the length of the soaking and the strength of the solution increased; however, all finally appeared, the greatest difference being only three or four days. As the crop matured there seemed little or no effect of the treatment upon the time of ripening. The plots were dug, the potatoes assorted into scabby and free from scab lots, and each lot was counted and weighed.

To state the results briefly, of the potatoes grown from untreated seed on the new land, 50.7 per cent. had more or less scab upon them, while on the land where potatoes were grown the previous year, there were 55 per cent. of scabby potatoes. This would tend to show that when infected seed is used it makes little or no difference whether it is virgin soil or not; when the seed used is but slightly infected the result would undoubtedly be about the same. Taking the average of the results obtained from the treated seed it was found that eight per cent. were scabby on the new land and twenty-eight per cent. on the old potato soil. From this it will be seen that less than one-sixth as many tubers were affected on the new soil when they were treated as when they were used without treatment, and that in the old soil the number was reduced fifty per cent. Of those grown from seed treated with the one to 1,000

solution, it was found that the scab was present upon seventeen per cent. of the tubers when the treatment was for less than one and one-half hours, and only about six per cent. when the seed was soaked ninety minutes or longer. For some unaccountable reason the figures for the 1 to 2,000 solution for the different periods were thirteen and three-fourths per cent. and six per cent. respectively, while the average for the 1 to 750 solution was about seven and one-half per cent. The yield of the plots treated with the 1 to 750 solution was about ten per cent. less than from the untreated, while upon the plots treated with the 1 to 1,000 and 1 to 2,000 solutions there was a slight gain on the treated plots in nearly every instance. The loss in yield where the 1 to 750 solution was used was undoubtedly due to the injury to the seed by the strong solution, and the consequent slow vegetation and weakness of plant. When the strength is still more increased the result is even more injurious. The gain in yield where the weaker solutions were used was caused by the fact that the presence of the scab upon a tuber checks its growth, and reduces the weight of the crop.

From the above results, and they are verified by numberless experiments elsewhere, it would seem that a solution of one part, by weight, of corrosive sublimate (mercuric bichloride) in two thousand parts of water, is fully as effectual in destroying the germs of potato scab as a stronger solution. While very satisfactory results were obtained in a treatment of from five to fifteen minutes, the amount of scab in the crop was considerably more reduced when the seed was immersed for from sixty to ninety minutes. To secure the full effect, the tubers should be well washed and scrubbed and should not be brought in contact with the germs after immersion by being placed in sacks, baskets or boxes that have contained potatoes unless they have been disinfected, nor should they be planted in fields where potatoes have been grown for at least two years. The land for potatoes should not be dressed with manure from animals that have been fed upon potatoes or potato parings, or with composted potato tops. The beneficial effect of the treatment is really much more than is shown by the figures as given, since many of the tubers grown from untreated seed were so badly diseased that nearly their whole surface was involved, and often to a considerable depth, while in every case where the tubers were treated the spots were quite small, most of them ranging from the size of a pin head to that of a lead pencil, and very few were so large that they could not be covered with a dime. Really, even in the cases where the duration of the treatment was quite short, and where as many as twenty per cent. were scabby, the selling value would be but slightly affected, while in the cases where the treatment was as recommended below, there was no appreciable injury. When the scab is very prevalent it exerts a several fold injury to the potato crop, as it not only reduces the total yield, but it renders unmarketable many tubers that would otherwise be of a salable size, and reduces their value even if they are placed in the marketable grade.

The seed is readily treated by taking one ounce of corrosive sublimate and after dissolving it in a quart of hot water, placing it in a barrel containing fifteen gallons, and then immersing the potatoes either whole or cut for planting, in it for ninety minutes. By placing about three pecks of seed in a sack or basket, they can be shaken about so as to bring them all in contact with the water. After immersion, they can be taken out and planted at once or spread out to dry. Corrosive sublimate is a deadly poison and should be carefully handled. In its very much diluted form it is harmless unless it be taken internally, but care should be used that neither the solution nor the treated seed are left where animals of any kind can have access to them. The treatment is so simple and the results so certain and remunerative that no one should attempt to grow potatoes without subjecting the seed to a fungicidal washing for the prevention of scab.

WHERE TO RUN AN INCUBATOR.

The incubator should be run in a place where as even a temperature as possible can be obtained; where the variation in temperature will be as little as possible. We have found that a dry, airy, moderately light cellar secures such conditions in a remarkable degree. The temperature is even, day and night, and varies comparatively little in cold or warm weather—of course it varies somewhat, but much less than in rooms all above ground. Where a business of raising large numbers of chickens is engaged in, a special building is erected for the incubators. One partially underground, where this is feasible, is usually built. When the building is all above ground it is best to have it ceiled without and within, enclosing a dead-air space, and having as few windows as possible. The machine should never stand where the direct rays of the sun will strike it. The roof, like the rest of the building, should enclose its space of dead air. The one thing to be kept steadily in view is securing uniformity of heat in the room where the incubator stands.

IMPROVING FARM POULTRY.

R. W. DAVISON, NEW JERSEY.

If eggs are wanted without regard to the weight of the hens, the Minorcas, or the Leghorns will give best results. If a good layer and market fowl combined is desired, then the White Wyandottes, Plymouth Rocks, Black Javas, or Langshans should be selected. Almost any kind of a hen will lay eggs in the spring or summer when eggs are cheap, but only a well-bred hen, well-housed and cared for, will produce eggs in winter when they bring thirty to forty cents per dozen. The majority of farmers will not go to the trouble or expense of procuring purebreds, or of keeping them pure after they have them. For such the next best thing to do is to sell off all the hens over one year old, and all the one-year-olds also, unless well built, strong and healthy. Next sell all the pullets except the best of the early hatched ones, and then sell every rooster and cockerel on the place. Now, if the hens are rather small it would be well to buy Light Brahma cockerels, early hatched ones, and those showing a good, strong growth. This will add weight to the next year's chickens. When next fall comes around do not be tempted, by the fine appearance of the young cockerels, to breed from them, for doing so will only be going back in the same old ruts; but rather sell off all the stock except the most promising of the early hatched pullets, and buy well developed and strong White Leghorn cockerels. The chicks from this cross will be a very little lighter in weight, and will make somewhat better layers than the Light Brahma cross. The third fall sort as before, but use Wyandotte or Plymouth Rock cockerels, and so on, always keeping in mind egg yield and fairly heavy carcass, the two most important points to the average farmer.

THE BEGINNINGS OF CHICKEN LIFE.

NANNIE CABELL, VIRGINIA.

Always take out the little chicks from under the hens as soon as they are dry, and even sometimes before they are quite dry. While the hen is hatching, the little things are very liable to be crushed. Their little peep is so faint that the hen does not know she is crushing them. I keep an old piece of soft flannel in a basket, in which I put them, and cover them well with it. Sometimes the hens are two days hatching, and as the chicks want to eat before this time I made, for greater convenience, a frame and covered it with wire gauze netting. This I set in front of an open wood fire. The frame keeps the chicks from running into the fire or under one's feet, and at the same time they have the full benefit of the fire, take a little exercise, and pick up some bread crumbs. By the time the hen is ready to take charge of them, they are quite strong and not easily crushed. The only time I lose any chickens is when I neglect to take these precautions. The easiest way to make one of these frames is to take two rounded pieces of barrel heading, and connect them at each side by an inch-square piece, then just tack the netting over this. Of course they may be made of any size desired, but I find one that is two feet long by eighteen inches wide, and five inches at the highest part, a convenient size.

Save all the broken china to crack up and give the growing chicks. They go frantic over it. I first began cracking it up in the yard where they were, but they crowded under the hammer so that I had to crack it up outside. A broken cup, saucer, or dish, does not seem so much a total loss now as it did before I found out this use for them. Throw wood ashes with bits of charcoal for them to eat. Have dust in heaps or boxes for them to wallow in, with gravel mixed in. Have feed troughs close to, and in fact fastened to the lower part of the yard fence. These will save many steps, for, except in the morning, when it is necessary to open coops and let out chicks, one need not go into the yards, but just drop feed from the outside into the troughs. The poultry business does not seem very large, but I find that more is made, considering time and outlay, than from many occupations that appear much more important. Those living in the country are the best off these hard times, with scarcity of work, and if more attention was paid to poultry on every farm, country folks would be still better off. I hope that all who try my ways will have my good success with poultry.

AN EDUCATIONAL POULTRY EXHIBITION.

H. S. BABCOCK.

All poultry exhibitions are, to a greater or less degree, educational. The array of long coops filled with the finest specimens that the poultryman has been able to produce cannot fail to instruct and interest any one who cares for fowls. He can learn what the different breeds and varieties are, how they look, their size, shape, color, markings, and the like. He may be able to learn, by an intelligent system of interrogation, something of the qualities of the fowls, though the information thus obtained, coming as it does from interested parties, sometimes needs to be taken with a grain of salt. Yet the educational influence of a poultry exhibition usually stops at this point, and nothing else is shown.

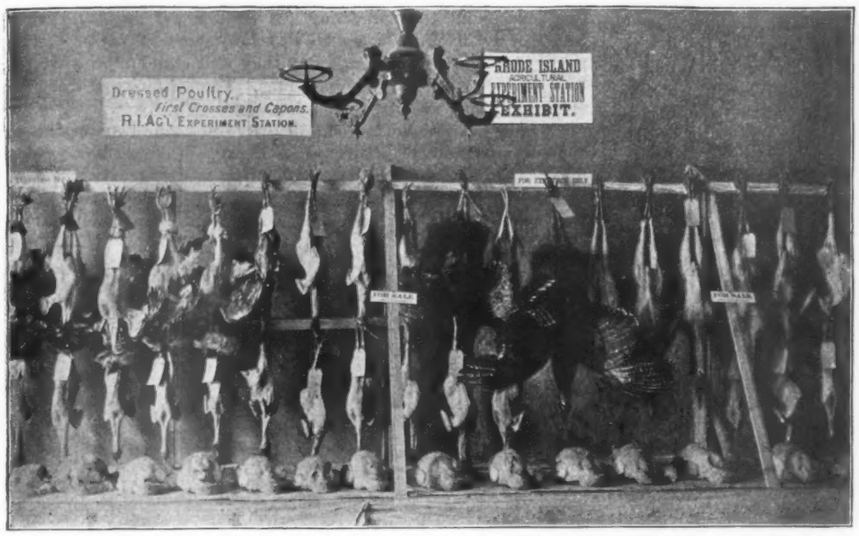


FIG. 1. FIRST AND SECOND CROSSES, CAPONS, TURKEYS AND GEESE.

But the exhibition held by the Rhode Island Poultry Association in December last was, in the best sense, an educational one. It afforded not only the instruction that can be gained from the ordinary poultry exhibition, but much more beside. The dressed poultry exhibit was a notable feature in itself, though for the best results it needed to be studied in connection with the live fowls in the adjoining hall. One could see in the dressed poultry department nearly all kinds of fowls carefully picked and labeled, the labels showing the breed or cross, and in the other department he could see the fowls as they appeared alive. It must have been surprising to some visitors to see what magnificent breasts were shown on the Indian Game crosses, after looking at the tall, apparently slender appearing live fowls. This exhibition certainly demonstrated, more clearly than any oral testimony could, the very great value the Indian Game possesses for the farmer or poulterer who raises fowls to kill. The exhibition of live and dressed cross-bred fowls made by the Rhode Island experiment station enabled one to know what crosses were the most valuable for the market poulterer. He could see here numerous different crosses, and could intelligently compare their relative values, so that he could place himself in a position to know what fowls would be the best for him to use for his particular purposes.

As capons and fowls of the same age and from the same crosses were shown alive and dressed, one could learn how much value caponizing possessed. If I read the results aright, the value of caponizing consists chiefly in the facts that the cockerels can be more easily kept together without danger of injuring one another, and that they remained in a tender, or "soft" condition, to a much greater age. The weights were somewhat greater when capons were kept for a long time, but when the cockerels were killed at six or eight months of age they were nearly of the same weight as the capons of a like age. Caponizing has value, but it seems to me that enthusiastic writers have overestimated the value in some instances. This exhibition was notable, also, for the magnificent display of turkeys that was made. Very few turkeys, even in a State like Rhode Island, famous as a turkey-raising State, usually appear at an exhibition; but here were ninety-one specimens, representing every variety except the buff, including wild, half and quarter wild turkeys crossed with native Rhode Island stock. If my memory is not at fault, this was the largest exhibit of turkeys ever made at a poultry show in the United States. The advantages of this exhibit, making known, as it did, where fresh blood could be procured at a reasonable price, must be incalculable to the turkey industry of Rhode Island. Many sales of turkeys were made, the benefits of which will probably be found in the stock that will be raised in 1894. The association also did a wise thing in hiring a hall and procuring, in connection with the State Board of Agriculture, two poultrymen to deliver addresses upon subjects that are of interest to poultry raisers. This may not be an entirely original feature, but it is a rare one for poultry societies. The good effects of this feature are already manifest. Probably other societies, convinced of the practical benefits of such a plan, will ingraft this feature upon their exhibitions, and poultry knowledge will thus be extended.

[The photographic engravings herewith give an excellent idea of the Rhode Island Agricultural Experiment Station Exhibit. In Fig. 1 are seen first and second crosses, capons, turkeys and geese; and in Fig. 2 capons, first crosses, and geese.]

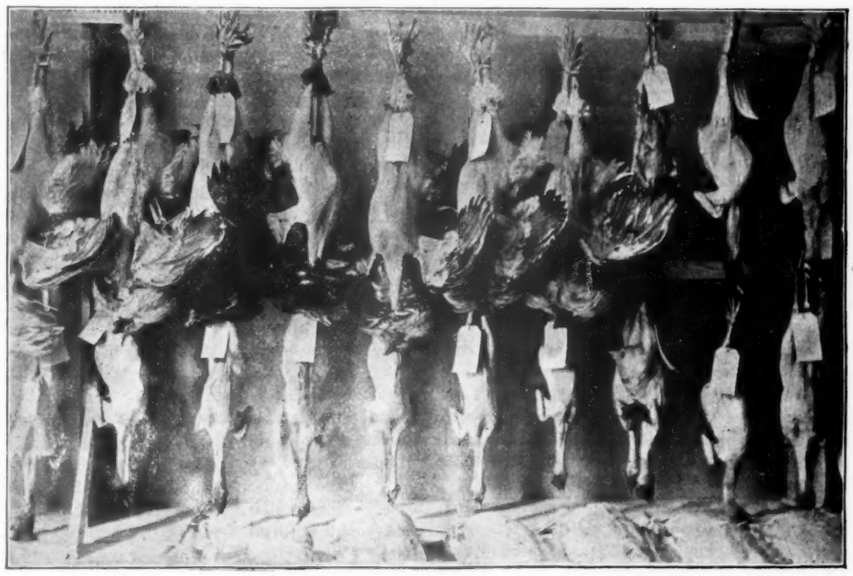


FIG. 2. CAPONS, FIRST CROSSES, AND GEESE.

Clean Water for Poultry.—The water dishes in the poultry houses soon get foul and unfit for use. They should be rinsed out and new water supplied each day, and as often as once a week be thoroughly washed with soap and hot water, and well scrubbed.

TESTING DUCK EGGS FOR HATCHING.

G. A. MCFETRIDGE, LONG ISLAND, N. Y.

In the hatching of ducks and other poultry, much loss is prevented by setting only fertile eggs, and if these are again examined during the early period of incubation, the nests need not be fouled by decaying and broken eggs which would entail further loss. I use the simple form of egg tester shown in the accompanying engravings. A sheet of tin six inches wide, eight and one-fourth inches long on one side and seven inches long on the other, has a two-inch circular hole cut out of it near the middle of the longer side so that the edge of the opening is one and one-fourth inches distant from that side. The sheet is now bent and soldered to form a tube, Fig. 1, six inches long, the larger end of which will fit on a lamp burner like an ordinary lamp chimney. Four slits are cut on the edge of the now oval-shaped opening on the side of the tube so that two clips of tin may be bent inward to hold a sheet of mica inside of the tube and against the opening. This allows the light to shine through. A second tube, one and a half inches long and nearly three inches in diameter, is now soldered at right angles to the first tube, and around the mica opening. A piece of black cloth is put over the short tube and held in place by a tin band. A one-inch hole is cut from near the top of the cloth to let the light shine through. The complete tester, Fig. 2, is placed as a chimney on a lighted lamp, and is always used in a dark room. The egg to be tested should be held large end up and placed against the hole in the dark cloth, when the light will shine through, more or less, according to the condition of the egg. The clear appearance of a fresh, fertile duck egg is shown in Fig. 3. The air space is small and near the broad end.

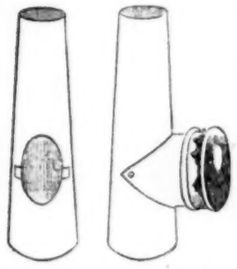


FIG. 1. FIG. 2. EGG TESTER.

A duck's egg on the fifth day of incubation has the appearance shown in Fig. 4. This egg shows a very strong germ. There are scarcely two germs that look exactly alike. Sometimes the germ seems to be around or rather the short way of the egg, while others seem lengthwise or diagonal. A strong germ is always near the large end. The germ is on the upper side of the yolk under the thin membrane which contains the yolk. The fertile germ becomes

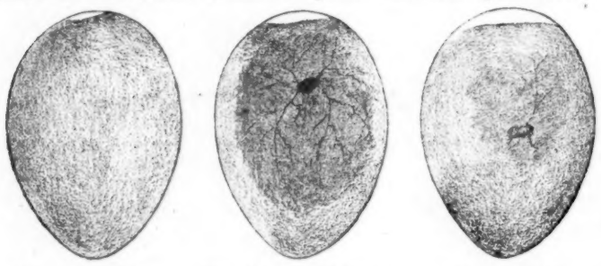


FIG. 3. CLEAR. FIG. 4. FIVE DAYS. FIG. 5. WEAK.

active as soon as the temperature reaches ninety degrees Fahrenheit, and incubation begins when the temperature reaches one hundred and two degrees.

A weak germ in a duck's egg on the fifth day of incubation is also illustrated, Fig. 5. This is what is called a doubtful egg, as only about ten per cent. of these hatch under the most favorable conditions. This will occur when the breeding ducks are too fat or when they are in an unhealthy condition. Such germs will be dead by the twelfth day. The strong embryo duck at the twelfth day of incubation is shown in Fig. 7. At this stage the embryo duck is on its back underneath the yolk. Its back rests on the under side of the shell and a portion of the time its head seems to be down between its feet, at other times it will slowly raise its head to the full length of the neck. At this stage the egg is very much clouded, the embryo can only be seen by the aid of a strong tester. The delicate blood vessels which branch out into the yolk in all directions now empty into one large blood vein, which enters the body at the navel. The yolk which has such a fine, plump appearance in a fresh laid egg is at this stage much changed. The sack which surrounds it has doubled its original size, and in appearance resembles the folds of a large intestine. Owing to its fatty condition it keeps to the upper side and, instead of being plump and round, it is spread out thin, and seems to occupy the irregular space above the embryo. By the end of the thirteenth day the skin is formed. The fourteenth day the down begins to make its appearance, the feet are formed and the toe-nails are visible.

Twenty-eight days are needed to hatch ducks and twenty-one days to hatch chickens. An examination of both the embryo duck and chicken on the fourteenth day of incubation shows the duck to be advanced as much as the chicken. The skin is formed on both at the same period. The down makes its appearance on ducks and chickens about the same day. A sudden jar any time from the first day until the fourteenth day may cause a rupture of some part. After the fourteenth day they will stand more variation of temperature and rougher handling. The majority of dead germs on the fifth day are due to rough usage.

The appearance of a good, healthy duck embryo on the twentieth day is plainly illustrated in Fig. 9. The egg is now opaque and the air sac should occupy one-fifth of the entire space of the egg shell. Up to this time little moisture need be supplied. By the twenty-fifth day the white has been completely absorbed

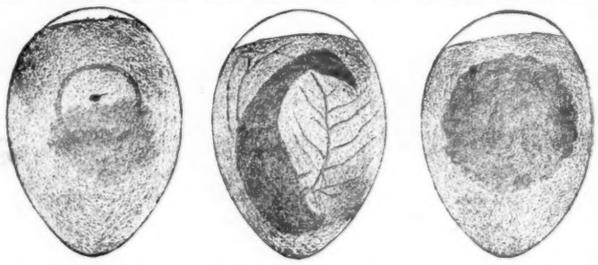


FIG. 6. DEAD. FIG. 7. TWELVE DAYS. FIG. 8. DEAD.

and there is no food left but the remains of the yolk. At this stage the yolk commences to enter the abdomen through the navel, a process which should be completed by the end of the twenty-seventh day, or even sooner. When this is complete the duck breaks the shell and walks out. On the twenty-sixth day, the duck has usually broken through the inner membrane with its neck, which is forced up into this space. The appearance of the unbroken egg in the tester is shown in Fig. 10. As soon as the membrane is broken the duck makes a chirping noise, often for several hours before the shell is broken.

Theory and practice are often at variance. The appearance of a dead germ on the fifth day is represented in Fig. 6. There is a small black spot with a red circle around it. In a few days this circle disappears and the egg soon decays. Such eggs should be removed on the fifth day. The appearance of a dead germ on the twelfth day is well shown in Fig. 8. There is but little difficulty in distinguishing an egg which contains a dead embryo on or after the twelfth day. After that they turn green very soon and their odor is very disagreeable. Such eggs are two degrees colder than those which contain live germs. The appearance of a duck egg in which, from various causes, the embryo cannot turn at pipping time is illustrated in Fig. 11. This will occur when too much moisture has been used. The duck will be very large, and can pip the shell, but cannot turn. The consequence is that it dies with its bill protruding from the shell, and its odor will not be pleasant on the twenty-eighth day. On the other hand where not enough of moist-

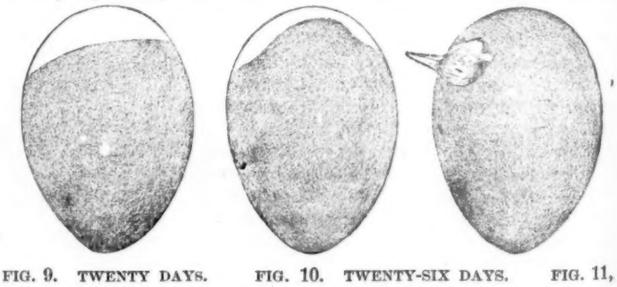
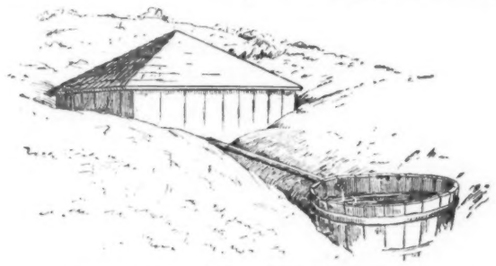


FIG. 9. TWENTY DAYS. FIG. 10. TWENTY-SIX DAYS. FIG. 11,

ure is used the duck cannot turn, from the fact that the membrane is dried fast. Unlike the former, the duck will not die on the twenty-eighth day, but will live for some days. The bill will not project, neither will there be such a bad odor as in the former case. By removing such eggs from the nests as will not hatch, I have much greater success in hatching duck eggs, and the above described tester is necessary for this purpose.

KEEPING PASTURE SPRINGS PURE.

Too many of the sources of the water supply of our pastures are contaminated by cattle wading in the springs and dropping their excrements within the basin in which the spring is situated, into which all loose material is washed by the rains of summer. Such contaminated water supply is highly undesirable for any stock to drink from, but most decidedly undesirable for the use of dairy cows. There is almost always a descending stretch of ground, or a descending open ditch, from pasture springs, which permits the keeping of the water supply pure. The spring should be completely enclosed and roofed over, and the water conveyed by a pipe to a tub or trough below, as shown in the accompanying illustration. Such a plan not only serves to keep the water pure at

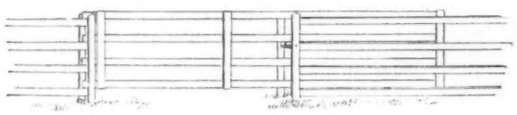


SPRING HOUSE AND WATERING TROUGH.

all times, but also to keep it cooler in summer and warmer in winter, if the spring is ever used for the winter watering of stock.

IMPROVED FARM GATE.

In making a gateway for a fourteen-foot roadway the gate should be twenty feet long. This allows for six feet to balance that part of the gate over the roadway, and in opening, a person merely takes a portion of the weight of the gate and slides the same a couple of feet, when it is balanced and can be opened as easily as if swung on hinges. This arrangement is shown in the illustration from a sketch by F. C. Farnham, of Washington. It is best to make a little roller with a three-fourth inch bolt, over which to run the gate. That part of the gate which slides on rollers should be made of double thickness of inch stuff. The gate should shut in between two posts set far enough apart to admit the end of the gate readily. This prevents the wind from moving the gate, which is as solid as any part of the fence. Make the rail of the gate, which runs on the



SECURE SLIDING GATE.

roller, one foot longer than the others; and nail to the two posts last mentioned a cross-piece, so that when the gate is shut the latch end will hang clear of the ground on this supporting piece.

A NEW DESIGN FOR A PIGSTY.

A good pigsty must have these points of merit in its construction: A site well drained; a building with room for the pigs to eat and sleep with comfort; a yard for exercise; good ventilation; a floor easily cleaned; an even temperature, without extremes of heat and cold; feed troughs with easily-managed swinging doors; rooms and yard easily accessible, with sliding gates, and the building ornamental rather than the usual unsightly hogpen. Careful measurements show that for the pigs usually kept by a village family, a double pen, covering an area twelve by eighteen feet, gives ample room for rearing four pigs, or for two in one part and a brood sow in the other. Perspective views of such a pigsty, planned by J. L. Townshend of Utah, are shown in the illustrations. The part inclosed with roof is nine by twelve feet (Fig. 1). A yard nine by twelve feet is attached to the rear. The sides of both building and yard are four feet high from the bottom of the sills to the top of the plates (Fig. 2). It is covered with a quarter-pitch roof, which is shingled on the rear slope. On the front slope is an upper space covered with sash, and below the sash are two shutters, so constructed that they can be raised and lowered, or folded back over the sash, at pleasure. This device permits closing up the building in cold and stormy weather, and the sash admits the warm sunshine in winter. In very warm weather the shutters are left

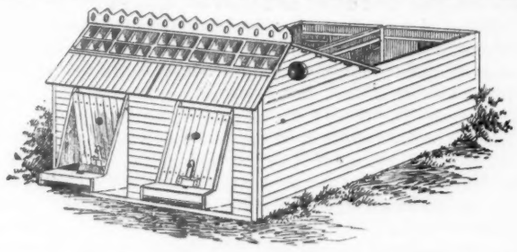


FIG. 1. PERSPECTIVE VIEW OF PIGGERY.

over the sash, thus providing ample shade below. The yard, where the site is dry and well drained, may be left unfloored; but to prevent stench and secure cleanliness, it had better be floored over. When the pen is new, the pigs should be confined for two or three hours in one corner of the yard, near the outer gate, till they have made it dirty with their droppings, and ever after they will go to that place with all their filth, keeping their beds and feeding places clean. The sliding gates are so made that all filth can be removed through them with a rake, hoe, or long-handled shovel, without entering the inclosure. In severely cold weather the sliding doors between the yard and house can be closed, making the rooms warm and comfortable. The sleepers, girts, plates and rafters may all be

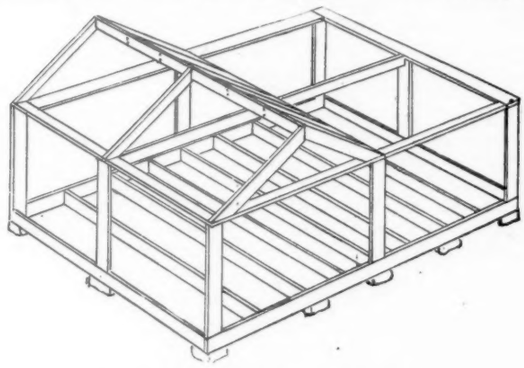


FIG. 2. FRAMEWORK OF PIGGERY.

of two-by-four scantling, and, when the yard is laid with flooring, will use the following material: Ten pieces twelve feet and two pieces eighteen feet long for the foundation; nine upright posts three and one-half feet long for corner posts and supports between; two pieces eighteen feet, and three pieces twelve feet long for top plates; two pieces eighteen feet long for partitions; two six feet

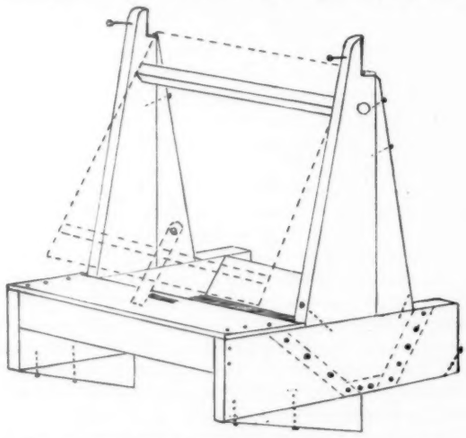


FIG. 3. DIAGRAM OF TROUGH AND SWING GATE.

long for the beds; ten six feet long for the rafters; two pieces two-by-two inches, sixteen feet long, for gates and doors. The floor will require two hundred and twenty-five feet of rough boards eighteen feet long and one and one-fourth inches thick. The sides will take three hundred and fifty feet of rough boards sixteen feet long, all but at gables to be cut in four-foot pieces. The partitions

will use fifty feet of rough boards fourteen feet long, th se to be cut in three and one-half foot pieces. The five sliding doors or gates, the two swinging feed doors, and the two shutters on the roof, will require about seventy-five feet of seven-eighths inch matched flooring. The roof will need seventy-five feet of sheathing and nearly a thousand shingles. Five common six-light eight-by-ten window sash are placed in a row, putty side up, on one-by-six inch cleats extending across the three front rafters. The ridge plate that supports the top of the rafters is of one and one-half-by-six inch stuff. Pieces of one and one-fourth-by-four inch stuff make the supports of the sliding doors. On the rough boards sheathing paper is tacked, and the exterior is then finished with rustic siding, corner strips and cornices. The building is painted with iron paint, and trimmed on cornices, corners, and doors with colors. The troughs and swinging gates above them (Fig. 3, Page 127) are built with these dimensions: The sides and bottom of troughs are thirty-eight inches long, the sides of two-by-eight, and the bottom of two-by-six inch stuff, chamfered to fit the bevel. The ends are twenty inches long, of two-by-eight inch plank. The upright side pieces are of two-by-eight inch plank, a slanting piece being ripped from one edge and nailed to the other edge of each, to make the sides wide at the bottom. The doors are of tongued and grooved flooring, nailed on two-by-two inch strips of spruce, the upper pieces having round, projecting tenons, that fit in two-inch holes in the side supports, to permit swinging to and fro. On each door a piece of two-by-four inch timber, with a slot for a wooden bolt, is securely nailed (Fig. 1). Upon the projecting ends of the trough, boards are nailed, which make convenient shelves, or steps for climbing into the pen. The middle partition in yard and house, with slide doors, permits the house to be used either as one or two pens. The bedding is kept in place by a scantling nailed across the corner of each room. When the house is closed tight, ventilation is provided through round holes one foot in diameter in each gable. These may have slide shutters, or be covered with wire cloth or lattice work, according to the climate where the building is erected. In rainy regions the floor should be made with a slant of two inches to the eighteen feet across the structure, and an eaves trough attached to conduct the water away from the yard. A three-inch hole in each feed door permits looking in when the shutters are closed.

OUR SMALL WHITE SWINE.

F. D. COBURN, KANSAS.

Following in the footsteps of those who put their faith in other breeds of swine, friends of the Suffolk, so-called, have organized and embarked in the formation of a pedigree register for their favorite breed. If the stock is in the country, or likely to be, to justify such an undertaking, it is a proper move; but where in any considerable number they are raised, beyond half a dozen or less here and there for family use, is a mystery to those living in the true pork-producing regions. They are not seen in the stock yards, they are not advertised in the agricultural nor live-stock journals, and do not appear at the fairs. Only three small lots were shown at the New Orleans Exposition in 1885, one being from Canada, one from Vermont, and one from Michigan. At the World's Columbian Exposition there were two small lots from Hillsdale county, Michigan, and a single animal from Ontario; scarcely enough in either instance to compete for half the prizes offered.

In America, when Suffolks are mentioned we understand by it a breed of small whites, originating in England, and sometimes called Prince Alberts or Windsor Castle pigs. Yet in England, some authorities claim that the real Suffolk is not white, but black. Professor James Long, in his "Book of the Pig," the latest British work on swine, says: "I find that Englishmen insist that the only swine entitled to be known as Suffolks are not white at all, but wholly black; in fact, so nearly like the Essex, except possibly a little smaller, as to be scarcely distinguishable, and sometimes spoken of as improved Essex." Further, "American breeders seem to have determined that we have in England a leading breed of swine known as Suffolk which is a white pig, but this is an entire fallacy." The fact that one or two Suffolk (county) breeders at the outside have at one time kept a herd of exceptionally good Small White pigs which they have chosen to call Suffolks is of no avail, inasmuch as they were identical with the small white pigs of England, hitherto generally known as Small Yorks. I regret that American breeders should have made the mistake and gone so far as to prepare standards and illustrations of a race which is not recognized in the country from which it is supposed to hail." On the other hand, Mr. Sanders Spencer, one of the most extensive breeders and disseminators of white pigs in England, writes that this statement of Prof. Long is "entirely misleading and contrary to fact."

Close observers of swine at the fairs and elsewhere have for years noted the remarkable similarity between the stock designated as Suffolks and their direct competitors, known as Small Yorkshires, which, by the way, have had for some time in America a public registry for pedigrees, and the query has arisen as to why they are not practically the same thing. It is of interest to note in this connection that the National Convention of Swine Breeders at Indianapolis in 1872, in its report on the characteristics of Suffolks, adopted the language of Sidney, the English authority at that time, to the effect that the "Suffolk is only another name for the Small Yorkshire pig."

This type of pig has had a peculiar career in the United States. No improved breed that we have has been longer before the public, and during all these years it has been excessivly admired for a little while here and there by the few who owned them, and yet they have made no general progress as a breed, nor in supplanting or improving any other, white or black. The few enterprising breeders who, twenty or twenty-five years ago, had faith enough in them to do some pushing and advertising of their claims, have apparently gone out of the business, or lost their faith, as they make no sign. The late Hon. John Wentworth of Chicago was one of the men who believed in the "little white hogs," first, last, and all the time, and William Smith, an extensive breeder and butcher of Detroit, maintained a stock of them credited as being very fine, believing them "unquestionably the earliest to mature, take on fat more readily, and produce more net pork with the same quantity of feed than any other of the hog kind, two pounds per day being no uncommon gain through the feeding season."

Theoretically, mated with Chester White sows, in some instances too coarse, their produce should be a happy medium, with more refinement and quicker fattening than the Chesters have, and more size, stamina and hair than the Suffolks or Yorkshires. In practice, however,—at least in the first cross—it scarcely ever results as intended; for part of the pigs of a litter are likely to be almost typical of one breed, and the remainder fac similes of the other parent; so much so that there would be difficulty in determining that they were not full bloods.

Owing to their evident likeness of color, form, quality and origin, it seems a pity that their friends cannot work together instead of dividing their strength. They should compare notes to see what, if any, the difference is between them; to see if the best of the so-called Suffolks are not really good enough Yorkshires, and the best of the Small Yorkshires do not practically fill the Suffolk scale of points. In such event they might, by rejecting the weeds in both sorts, and mating the best specimens (and if they are not already identical the doing of this should give an increase of vigor), obtain a breed better than either, while preserving the type, and make their effort a united one to win whatever high place in popular estimation its worth might justify. If worthy of a foremost place, the breed could not be kept in the background; and, other conditions being equal, one herd book, for a variety of reasons, should be preferable to two. As a cross on other breeds, the Suffolks have been found in some hands to cross very profitably with the Essex. E. W. Cottrell, of Michigan, who had much experience with Suffolks, Essex and Berkshires, side by side, both pure and crossed, says the very best results he ever obtained by crossing thoroughbreds were from Suffolk upon Essex. An illustration of this was a litter farrowed March 16th and pushed from October 1st until December 24th, when none weighed less than three hundred and one four hundred and two pounds, being but nine months and eighteen days old. Pigs of this cross invariably came with an excess of black on the hind parts and white predominating in front, making a striking and peculiar contrast. This is not best if carried further, for usually mating these cross-breds does not give animals of the same excellence as the first cross of the pure-breds.

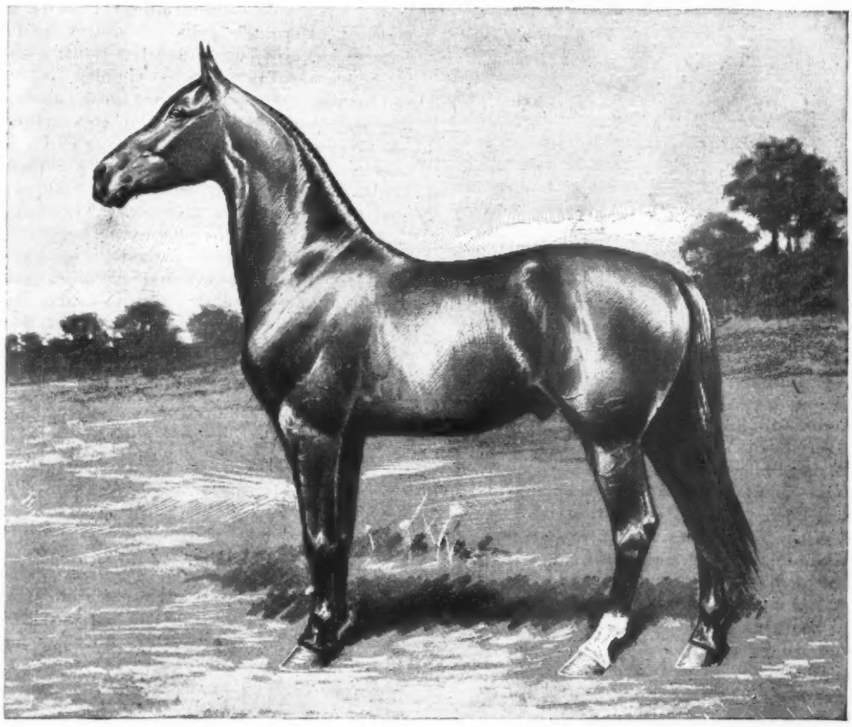
Marketing Hogs.—Driving hogs to market over country roads is slow work. It does not do either the hogs or the owners any good. If you have much distance to travel, better load them into big wagons. You will accomplish the work more quickly and easily. In the long run, action and reaction in prices are bound to be very nearly equal. Consequently hogs will go down again some day. But if they do, do not be as foolish as you were before, and go wholly out of the business of growing them. You will want them again some day, all of a sudden. If you have not a very large

drove of hogs, and they are nicely finished medium weights, perhaps your local butcher will pay a little more than dealers' price for them. We have often found that to be the case, and besides they would take them a few at a time, so that every week you could pick out the ones that were just right for killing. This saves feeding these while the others are fattening. After hogs are ready for market, it is expensive business feeding corn to them and waiting for the market to improve. If you use scales, and accept their verdict, they will probably tell you that the corn costs as much, or more, than you get from the increased price. And it must be taken into consideration also that the better price does not always come.

THE AMERICAN TROTTER.

MAGNUS FLAWS.

The rapid development of speed in the light harness horse seems almost marvelous. Scarcely a record of any consequence of a year ago remains unbroken. True, the 2:04 of Nancy Hanks still stands, as well as Arion's two year old mark of 2:10¼, but the others have been so materially reduced that one almost forgets those that still remain. The yearly record of 2:25¼ made by Frow Frow in 1891, has been supplemented by the 2:23¾ performance of the chestnut filly, Pansy McGregor. Just think of it for a moment—a yearling filly trotting a full mile without a break in 2:23¾. It seems like cruelty, but we are told she accomplished the feat with the ease of an old campaigner. In the three-year-old class, Fantasy, with a mark of 2:08¾, now wears the crown, which was held by both Sunol and Arion heretofore. It is the same blood, however, the two former champions being by Electioneer and the newly-crowned queen being by a son of his. The four-year-old records of 2:10 held by Moquette and Alix, has been eclipsed by that most transcendent of all performers that ever appeared on the trotting turf, the black stallion Directum, whose mark is now 2:05¼. From queen of four-year-olds last year Alix, the little bay beauty by Patronage, advances to the five-year-old throne, which she now occupies jointly with the great Kremlin, the mark being 2:07¾.



TYPICAL AMERICAN TROTTER.

The wagon record of 2:15 heretofore held by Allerton, is now supplanted by that of 2:13, made by the erratic black gelding, Guy Greenlander, now holding the two-mile record, by virtue of having reduced the 4:33¼ made by Nightingale last season, 1¼ seconds. Bishop Hero, a bay gelding by Bishop, set a new mark for five miles by trotting in a race in 12:30¼.

While all this and more has been accomplished by the trotters, the pacers have not been idle. May Marshall, by going in 2:08¼ holds the fastest record for mares. Flying Gib's 2:04 gives him the same honor for geldings. The Texas filly, Lena Hill, now holds the two-year-old mark, 2:12¾. Effie Powers, by Anderson Wilkes, jointly with La Belle, ties the three-year-old record, having paced in 2:12¾, and Saladin, by Sultan, now holds the record for stallion in a race, having paced in 2:05¾. The foregoing constitute all the principal records, but in addition there are a host of minor ones, while the race record for almost all heats singly and collectively, those for half-mile tracks, etc., have shared in the general reduction.

That the light harness horse has carried himself equally as well in the show ring, the exhibition of live stock at the World's Columbian Exposition demonstrated fully. One thing is certain, and that is that while England may have her Shire and Thoroughbred, France her Percheron, Germany her Coach, Scotland her Clyde and Shetland, and Russia her Orloff horse, yet America, young as her breeding operations have been, has a native product—a national horse—the peer of them all—the great American Trotter or Roadster. I am well aware of the fact that there are American bred horses of the foreign breeds named that are the peers and superiors of imported stock, yet after all we cannot call these horses American, they are simply the foreign horse being perpetuated. Not so the American roadster. That clean-limbed, fleet-footed, well-balanced, kind and intelligent animal we observe in a Nancy Hanks, an Alix or a Directum, has no counterpart on the face of the globe, save on this continent where we have particular conditions and needs.

Passing from the track and show ring, we come to the question of the most vital interest to the breeder, "Does it pay to raise the trotter?" The recent apparent failures along this line prove that it does. The overproduction of worthless stock, who had a fictitious value owing to being labeled "standard-breds;" the widespread business depression, and other causes, have served to bring the price of trotting stock to its proper value. It will no longer be necessary to pay a stallion fee which is larger than the resulting colt would bring when one year old or more. It will no longer be necessary for a gentleman to pay for a supposed race horse when he wanted only a road horse. On this true basis the farmer can afford to breed the best of all general purpose horses, and with the returning of better financial times, the demand for good horses for the road and all other light purposes will be general, at remunerative prices. It has always been the writer's contention that when we abandoned the idea that the American trotter was a "racing machine," and his breeding, raising and owning, the privilege only as a luxury for the rich, and on the contrary realized that he was the great all purpose road horse, farm horse, and work horse suitable for the vast continent, so soon would the business of breeding and raising him prove profitable, and it would seem we are about on the eve of this realization.

Clear the Fence Rows.—Many farms have belts of young trees and bushes from ten to fifteen feet wide along the road and line fences. They form a thicket which encroaches yearly upon the fields they border. It seems strange that any farmer should allow such a condition of things to exist, but many do from sheer carelessness. Sometime they mean to cut the bushes, but the work is put off from time to time because other work seems more important. Such thickets about fields form lurking-places for animals and foul weeds, from which much damage can be expected to growing crops, to say nothing of the amount of soil given up to them. There is not only great wastefulness in such farming, but it gives a farm an untidy, slovenly look which ought to be avoided. This is a good "cleaning-up time," and it would be a good plan to cut down the bushes about the fences now, and have the land they have injuriously occupied so long in a shape for use next spring.

CLUB ROOT OF CABBAGE AND ITS ALLIES.

DR. B. D. HALSTED, NEW JERSEY EXPERIMENT STATION.

The injury to the cabbage and turnip crops attacked by club root may be considerable, sometimes incurring almost a total loss,

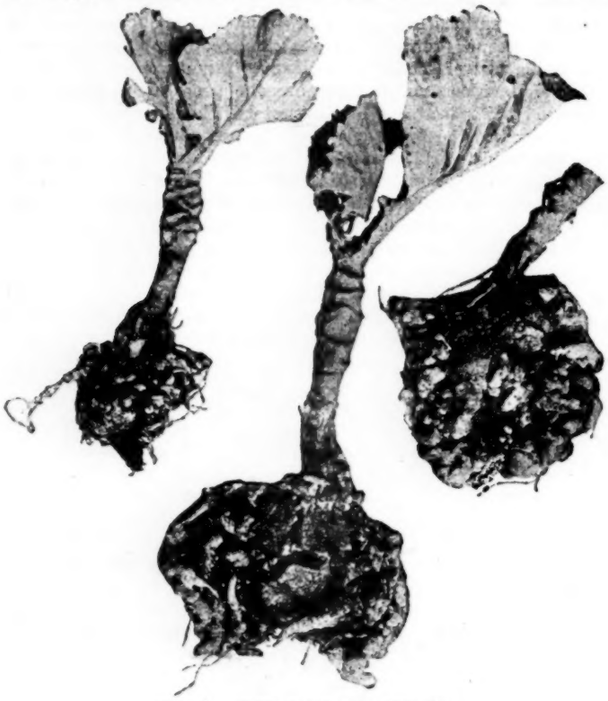


FIG. 1. CLUB ROOT OF CABBAGE.

and in the aggregate the destruction for the whole country is doubtless represented by millions of dollars. It is particularly severe in the eastern portion of the United States, but is not unknown in the West and South, and during the summer of 1893 it prevailed extensively in the truck regions around the large cities of New York and Philadelphia.

The Nature of Club Root.—In order that the reader may derive the most practical good from any suggestions as to use of preventives, and other treatment of the disease, it is best to place before him the facts thus far obtained concerning club root. The name of the malady is quite descriptive, for it is an affection of the roots, which become much distorted. The roots may begin to show enlargements while they are quite small and before the plants are more than seedlings. Thus cabbages while growing in the hotbed may show unmistakable signs of "clubbing," followed by a loss of vitality throughout the whole plant. The affected parts soon begin to decay, becoming very offensive, and, from places near by, other roots are developed which, in turn, become swollen and distorted into various shapes. Of the most interest in this connection is the cause of the peculiar development and consequent destruction of the infested plants. As in nearly all instances of similar abnormal structures, these root galls were long ago assigned to insects. A careful study of their development failed, however, to convict any species or group of insects of these depredations, and after much speculation, and no end of articles in the agricultural journals and elsewhere, it was reserved for M. Woronin, a European botanist, after three years of painstaking and exhaustive study, to explain the nature of the subject before us. Instead of any insects being the cause, although such decaying masses usually become the breeding places for them, Woronin found that a low form of fungus was constantly present in the affected parts. This parasitic organism is only seen with the higher powers of the compound microscope. The family of fungi to which it belongs, namely, the slime mold, is widely distinct from the mildews, rusts and smuts. The life of the obscure club root parasite has been traced from its appearance in the root as a slime in certain cells to the formation of multitudes of spores in these same cells. By the decay of the roots, which takes place rapidly, and with much offensive odor, the spores are set free in the soil. These spores there germinate by producing moving bodies capable of penetrating or being absorbed by the thin walls of the hairs and other superficial cells of the roots. The soil becomes diseased in the sense that the germs, formed in the swellings and other distortions of the roots, are set free, and the earth holds them for an indefinite length of time. Fig. 1 shows three small badly "clubbed" cabbage plants half natural size; Fig. 2 are young turnips similarly ruined, while affected cauliflower plants are shown in Fig. 3. These engravings are all from photographs of freshly collected plants, and are not the worst specimens of the malady that might have been selected. Brussels sprouts and kale were found equally badly diseased.

Club Root in Weeds.—In addition to the plants above named the club root fungus (*Plasmodiophora Brassicae*, Wor.) infests the cultivated Stock and Candytuft, but in this country to no alarming extent. In this connection it is, however, interesting to add two genera of weeds upon species of which the galls of slime molds have been recently found in abundance, namely, the Shepherd's-purse and Hedge-mustard. Fig. 4 shows a group of the infested roots of the shepherd's-purse reproduced natural size. The reader needs to bear in mind that these roots are neither large nor fleshy, and the galls are correspondingly small. The enlargement is usually just below the crown, but other parts of the root system may be affected. In Fig. 5 is shown a similar group of the diseased roots of the hedge-mustard. Here the galls are nearer hemispherical and may be expected at any place upon the roots. These weeds bearing the club root were found in the vicinity of infested fields of cabbage and turnip, and help to account for the latter, as such weeds growing in waste land serve to keep up continuous germs of the disease.

Precautions and Treatment. — From a consideration of the nature of the club root fungus and a knowledge of the different kinds of plants infested by it, there may be some suggestion gathered as to preventive measures. When it is understood that the club root and all the injury to the crop accompanying it is due to an internal subterranean parasite, it becomes evident that no treatment to which the infested plant may be subjected can give promise of a cure. Preventive measures must be relied upon, and, in the first place, all the refuse of a cabbage, turnip or other infested crop should be removed from the soil and burned. To leave cabbage stumps in the field, to feed them to live stock, or to

FIG. 2. CLUB ROOT OF TURNIP.

throw them in the compost heaps, are three of the worst methods of propagating and spreading the malady on the farm. It is not enough to destroy the roots, for the Plasmodiophora is found also

in the leaves and stems of infested plants. Seedlings of cruciferous plants grown in the hotbed should be examined carefully, and, if they show signs of the club root, consigned to the fire. If only a few portions of the plants are clubbed, it may be wise to discard the whole lot rather than lose the crop in the field. Start with healthy plants. In view of the fact that the soil may become more or less impregnated with the germs during the growth of a crop susceptible to the Plasmodiophora, it is evident that a wise precaution consists in a judicious rotation of crops. Just what that rotation should be, is a question for each grower to decide for himself; but, for the best results, cabbages, or any allied crop, should not be upon the soil oftener than once in three years. Cabbage, kale, Brussels sprouts, kohlrabi, turnips or radishes should not follow each other if club root is prevalent in the ground.

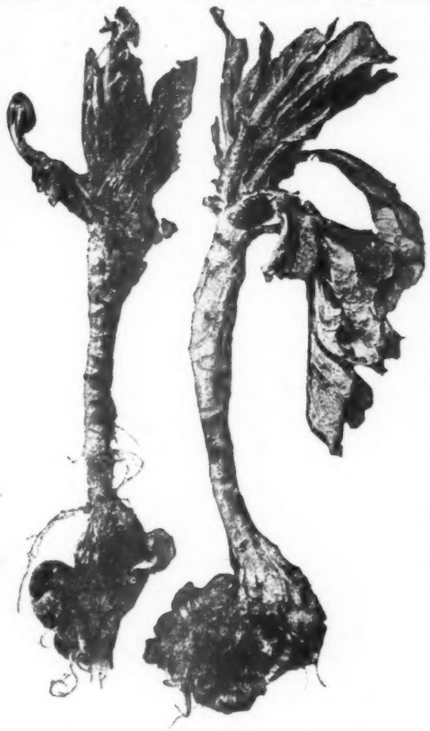


FIG. 3. CLUB ROOT OF CAULIFLOWER.

It is possible to get relief by the use of some of the commercial fertilizers; but this needs confirmation through trial. It is a fact that is being acted upon in some of the large truck regions near New York, that lime is an effective preventive of the club root, and, by its constant use, at the rate of seventy-five bushels or so per acre each year, cabbages have been grown at frequent intervals almost yearly upon the same soil. It is likely that a soil naturally abounding in lime may be the best suited for cruciferous crops, so far as club root is concerned. Lastly, it has been shown that common cruciferous weeds harbor the fungus enemy, and, while the farmer may be thankful for the loss of his hedge mustard and shepherd's purse, through "clubbing," this is a case where such weeds can be more cheaply destroyed in some other way.

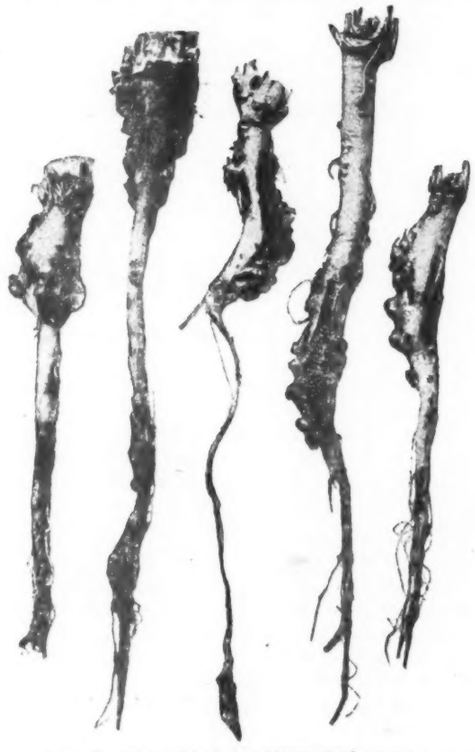


FIG. 4. CLUB ROOT OF SHEPHERD'S PURSE.

IMPORTANCE OF BACTERIOLOGY TO FARMERS.

EUGENE MURRAY AARON, PH. D.

When the science of bacteriology is mentioned it is generally spoken of as an important factor in human medicine solely, calling to mind what its pursuit has done in recent years toward a better knowledge of the pathology of hydrophobia, cholera, consumption, splenic fever, and other less prevalent diseases. Yet this is by no means its only important field, wherein great gains are to be expected, for it became a science through Pasteur's investigations with the silkworm disease in France. Results recently obtained in agricultural bacteriology are of incalculable value, their money-saving quality promising to be almost beyond computation. To the agriculturist bacteria and other microbes come both as friend and foe; how to aid the friendly work of the one, and how to retard and diminish the ravages of the other are items in the study of the agricultural bacteriologist of the first magnitude. The bacteria of glanders, hog cholera, sheep fever, swine plague, chicken cholera and swine erysipelas, all call for closer observation, as do their parasitic cousins found in the human subject. Beyond them, but of importance seemingly in keeping with the difficulty of their study, we have the fungus invasions that cause apple and pear blight, oat blight, and that of corn and sorghum.

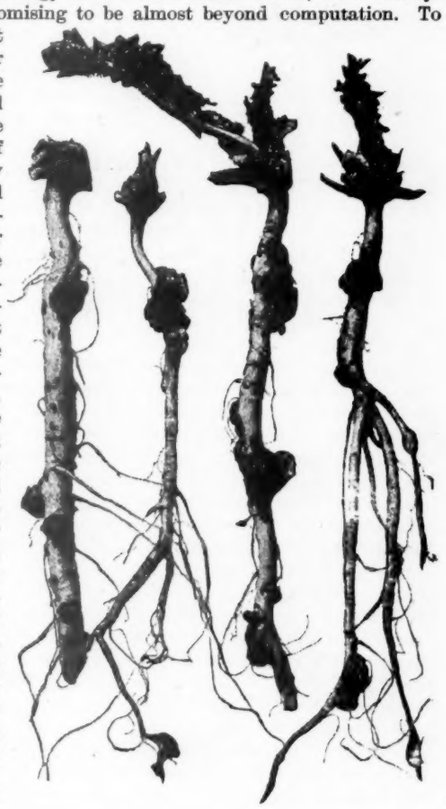


FIG. 5. CLUB ROOT OF HEDGE MUSTARD.

Pasteur was the first to suggest that the very necessary production of nitric acid in the soil might be due to fermentation produced by bacteria, and to-day the work of Schloesing and others has resulted in the present accepted biological theory of nitrification, of as great value to sanitary science as to agriculture. So, also, of the absorption by plants of the nitrogen of the air, again bacteriology steps in to our aid. Long ago Liebig concluded that as clover and its allies could be grown on the same ground for years without requiring the addition of fertilizers, they must absorb nitrogen from the air, and transfer it through their roots or their decay to the soil. To-day, however, it is understood that it is the presence of certain bacteria in the small excrescences or swellings on the roots of this family of plants which solve the problem. As Prof. Russell has pointed out, "the artificial selection and cultivation of those forms that have the greatest ability as nitrogen collectors is a question of prime importance. Like that of nitrification it involves great economic interests, inasmuch as it is the key to the solution of the important question of the restoration of impoverished soils." Again, in the dairy, bacteriology assumes prime importance. Milk direct from the cow is entirely free from germ life, but its heat and nutritious

qualities render it most prone to germ action; hence the so-called "diseases" of milk so inimical to the milk dealers' interest. On the other hand some of these very germs are those which produce the desirable fermentations in cream known as "ripening" and "souring," from which much-sought flavors and fancy prices in butter are derived. The isolation and propagation of these germs is now an engrossing pursuit in more than one well-equipped bacteriological laboratory.

The entomologist also is beginning to discover that in many ways he can utilize these tiny creations in that branch of science known as Economic Entomology. There are but few larvæ that have not certain parasitic growths which at times attack them, but the control of such enemies is as yet an art in its infancy. There are certain fungi and bacteria that mean death to the chinchbug, to the potato beetle and to the clothes moth, and there is every reason to believe that the students of this science are now on the verge of discoveries that will lead to the final control of these and many kindred pests. Hence, as this hasty glance has demonstrated, in every principal branch of agricultural science, bacteriology is assuming a position of major importance.

HOW TO USE THE BABCOCK MILK TEST.

E. H. FARRINGTON, ILLINOIS AGRICULTURAL EXPERIMENT STATION.

When the inventor gave this method of milk testing to the public, it was first tried by chemists of experiment stations, or persons who were somewhat familiar with the chemical actions involved in the process. They found the results obtained by it were accurate as compared with those of the gravimetric methods they had previously used for getting the per cent. of fat in milk; and to them the making of a test was wonderfully simple. The directions first sent out by Dr. Babcock with this test were sufficient instructions for that class of workers to get good results. As its field of usefulness broadened and the men that milked the cows began to use the tester, it was soon discovered that the Babcock milk test was not an automatic machine. Although very simple to a chemist it was found to be not like a clock, which only needed to be wound up and left to run itself for ten minutes to give accurate results, but the wheels must be watched, the milk properly mixed, and the strength of the acid be correct.

Experience with this test which was in constant use at the World's Fair dairy test taught us to keep a watchful eye on the following points: The mixing and temperature of the milk; strength, temperature and quantity of the acid, and the need of keeping the acid bottle corked up when not in use. Also measuring and mixing the acid and milk in the test bottle, adding the hot water, measuring the fat and regulating the speed of the machine.

The inquiries frequently received seem to show that black or white stuff separating with the fat is the difficulty most frequently met with. They make an obscure reading of the per cent. of fat because of the indistinct separation of the liquids. The common remedy suggested for this difficulty has been a change of acid. If there is "black stuff" in the fat, get a weaker acid; if a white curd separates in the fat column, change to a stronger acid. That a too strong or a too weak acid may cause this trouble, is undoubtedly correct in many cases, but not always. The manipulation of the test may also cause these defects. It was found that nearly, if not all, the acid sold in Chicago for this purpose was made at one factory, and by conversation with the manufacturer it was learned that the still making this acid was running day and night, turning out the same quality of acid without change.

It has generally been supposed to be easier to test a mixture of the milk of several cows than the milk of one cow, and that possibly there might be found a cow's milk which could not be successfully tested. The observations given in this article are the results of a great many experiments made with the milk of each of the seventy-five cows in the dairy test at the World's Columbian Exposition. From May to October were made at least one hundred and fifty tests of milk every day. During this time samples of a great variety of milks have been tested. There have been great variations in the composition of these milks and in the characteristics and health of the cows. I was able to test successfully any milk received, and by proper manipulation to get a clear separation of the fat.

It is my opinion that returning the supply of acid to the party from whom it was bought is often unnecessary. Any person who has trouble from either the black or white substance separating with the fat can probably remedy the difficulty by some changes in the manipulation, provided the acid is anywhere between 1.82 and 1.83 specific gravity at 60° F. The black substance that appears is probably charred fat, and indicates too strong an action of the acid on the milk. The white adulteration of the fat shows either too weak a reaction or an incomplete separation by the centrifuge. Each of these defects can, of course, be produced by acid either very much too strong, or too weak. They can also be brought out by different manipulation when acid having the correct strength is used. An entirely satisfactory working of the Babcock milk test can be expected, if, in addition to the elaborate details which the originator of the method has already worked out, the following precautions are observed:

First—An acid having 1.82 specific gravity should be used with milk at 60° to 70° F. If the acid is stronger, cool the milk to a lower temperature. Somewhat weaker acid can probably be made to work all right by warming the milk.

Second—When measuring the acid into the test bottles, hold the bottle at an angle that will cause the acid to follow the inside walls to the bottom of the bottle and not drop through the milk in the center of the bottle. If properly poured into the test bottle there will be a distinct layer of milk and acid with little or no black color between them.

Third—Thoroughly mix the milk and acid as soon as measured into the test bottle. A better separation of fat is obtained by mixing at once than by allowing the two liquids to stand unmixed in the bottle until enough tests have been measured out to fill the centrifuge.

Fourth—After five minutes whirling of the test bottles in the centrifuge, add hot water until the test bottle is filled up to the neck only; run the centrifuge another minute. Adding the necessary hot water in two portions is often a great help in getting a clear separation of fat. When the test bottles are taken from the centrifuge they are put into water at 140° to 160° F., and the per cent. of fat read at that temperature.

Fifth—Too low results will be obtained if the centrifuge does not have sufficient speed. The machines have to be watched, as constant use wears some of them so that the speed designed by the manufacturer is not obtained.

Sixth—When testing skim milks or buttermilks which have a very small per cent. of fat—two-tenths of one per cent. or less—the reading of the per cent. of fat should be made immediately on taking the test bottle from the centrifuge. If this is not done, and the test bottle cools before taking the reading, the contraction of the liquid in the bottle will often leave the fat spread over the inside surface of the measuring tube so that it is not seen, but has the appearance of being only a dirty tube. If read when taken from the machine, the small fat globules can be seen and estimated.

GLEANINGS FROM THE COW STABLE.

GEORGE E. NEWELL.

Ring the nose of even the "safe" bull.

If your dairy has no pedigree, start one at once.

The cow with a ruffled temper will yield poor milk.

All straw and no hay will turn a bright heifer into a dull cow.

A dirty strainer reflects as badly on the milker as on her who washes it.

A good way to choke a valuable cow is to feed her uncut vegetables.

Too much carbonaceous food in the dairy will make fat beef faster than butter fat.

A cow that begins to lose flesh before the winter is gone, will be "spring poor" by the month of May.

Do not let the milk get cold before it is carried from the milking stable to the dairy house to be strained.

Give the animals plenty of room in the stable in which to lie down, if you would make them comfortable.

Sawdust in the manure heap represents so much inert matter; land plaster is an absorbent that is also a fertilizer.

To feed economically, and yet sufficiently, give the cows only what they will eat up clean. Trying to stuff them beyond this limit will result in loss and not gain.

Do not feed the hay down to the bare boards in the mow over the stable; for if you do the ingress of cold air from this source will result in a veritable exposure to your dairy.

Think twice before you go into the business of raising veal calves by letting them suckle their dams. The system will have a demoralizing effect on the dairy, offsetting the temporary gain.

A NEW INDUSTRY—PINEAPPLE FIBER.

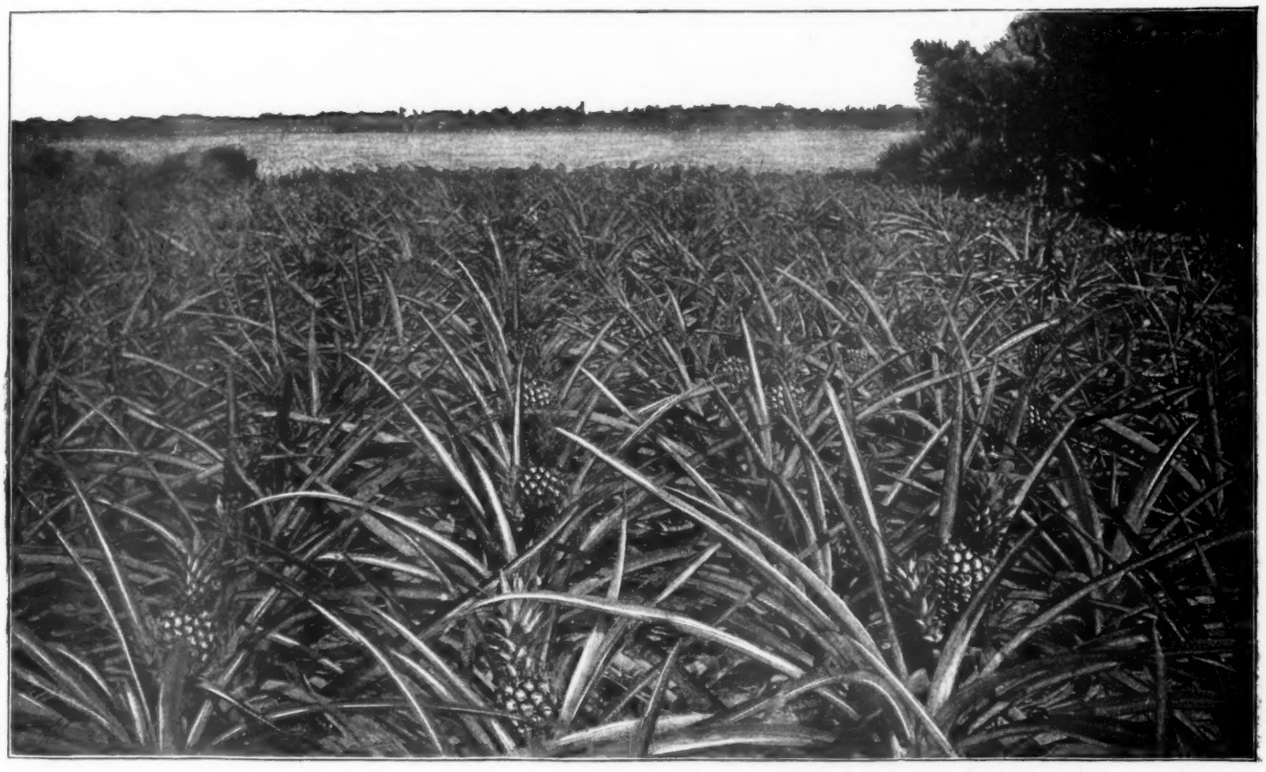
FRANK W. HAWTHORNE, FLORIDA.

Florida is the only State in the Union which can grow pineapples with profit, and only certain portions of that State are adapted to its successful cultivation. It is valuable not only as a food plant but also as a fiber plant, and the development of the pineapple industry in Florida is now going on very rapidly by reason of these two profit-producing conditions.

It is only in recent years, comparatively, that the pineapple has been used as a food by the masses of the people in this country. The fruit is quickly perishable, and up to a year or so ago the means of transportation to market from the pineapple-producing sections were so slow and uncertain that that portion of the crop which found its way to market in good condition had to be retailed at very high prices, which placed pineapples among the luxuries and beyond the free use of a majority of the people. Now, however, the extension of the railway system down the East Coast of Florida as far as Lake Worth has cheapened transportation and so quickened it that Florida "pines" can be placed in every central fruit market of the United States without danger of decay in transit. As a food for the masses, pineapples will, therefore, come rapidly into general use, and the health-promoting properties of the fruit will have an immediate and a marked effect upon the general welfare of the people.

But it is as a fiber-producing plant that the pineapple has the most promise as a wealth-maker. Charles Richard Dodge, who has conducted very extensive experiments with fiber plants, says that the fiber of the Florida pineapple leaf—especially that in the Lake Worth and Indian River sections—yields readily to treatment in the alkaline bath, and its filaments are easily subdivided, especially when subjected to trituration. It is claimed also for the Florida pineapple fiber that constant immersion in water does not in the least injure it; in fact, the natives of the East Indies increase this property of their pineapple fiber by tanning it, though this is probably done at the expense of strength. In tests of strength pineapple fiber exhibits a superior tenacity. A sample from Singapore bore a strain of three hundred and fifty pounds, against two hundred and sixty pounds for New Zealand flax. In the Journal of the Agricultural Society of India there is a record of a rope of pineapple fiber three and one-fourth inches in circumference standing a strain of fifty-seven hundred pounds, or nearly three tons, before breaking. When preparing the fiber of the pineapple, the leaves must be manipulated in the green state, as nothing can be done with them when dry. The yield of the fiber from the pineapple leaves of the East Coast is very prolific. Two or three different machines for shredding the fiber are now in use, but none of them are perfect as yet in their work. The waste is excessive and the process not so rapid as it should be to secure the best results. Experiments show that the yield of fiber from freshly-cut leaves in the Lake Worth region ranges from forty-five to sixty pounds from a ton of leaves, which is a remarkably good showing.

As to the value of pineapple fiber, no authoritative figures can be given, as it is not yet a convenient product in this country. But Mr. Dodge is of the opinion that, if the fiber could be produced in quantity at an economical cost, manufacturers would soon find a use for it, and would directly learn what price they could afford to pay for it. The market price would then be fixed by the demand and the supply. One of the machines now in use can clean and shred eight thousand leaves per day, or only about eighteen pounds of fiber, which would make the product somewhat high-priced for binders, ropes and cables. But this pineapple fiber can be manufactured into the most delicate fabrics, strongly resembling silk, and for this purpose it will soon command a price much higher than any other of the leaf fibers that are grown in this country.



PINEAPPLE PLANTATION AT LAKE WORTH, FLORIDA.

Large quantities of pineapple fiber are annually exported from the Isthmus of Panama and from the West Indies to Old Spain, where it is manufactured into thin dress goods for ladies, and then returned to the place of original export. The pineapple cloth is very fine, thin and light, and is particularly adapted to wear in the countries of the semi-tropics, where the plant grows in its greatest luxuriance. In all probability capitalists will, in the course of the next year or two, establish extensive machinery plants along the Indian River country, in the Lake Worth region, and even down as far as Bay Biscayne, for the minipulation of the leaves of the sisal hemp plant and the pineapple plant, after which the greater portion of the commercial fibers consumed in this country will be produced along the Florida East Coast. The pineapple is propagated by planting the crown at the top of the fruit, the slips growing from the base of the crown, or the base of the fruit, or the suckers growing from the roots. [A field of pineapples in full bearing, at Lake Worth, Florida, is seen in the above engraving.]

EGG PLANT CULTURE IN THE SOUTH.

S. A. COOK, GEORGIA.

Many persons labor under the impression that the egg plant is very difficult to grow, and consequently are led into neglecting its culture from year to year, simply from the desire to include no uncertain crops in their horticultural undertakings. From a practical experience of over twenty years in the culture of this vegetable, I have no hesitation in asserting that, of the tender garden plants it is one of the easiest to raise, provided that its few but obvious requirements are fully supplied. One of these is good seed of a good variety, which should be sown in cold frames early enough to secure strong, stocky plants, ready for transplanting to the open ground as soon as frost will permit; plant in soil abundantly supplied with humus, in addition to the necessary elements of plant food; and devise full protection from the flea beetles, which are very destructive to the young plants. A dozen or more varieties of egg plants are described in the catalogues, but practically I have never found need for other than the New York Improved.

While it is possible, with the aid of insecticides as repellants, to grow the plants in frames placed upon the surface of the earth, I have nearly always raised my cold frame for egg plants and peppers four to five feet above the ground. A week or so before the time for sowing, which is about February first, a strong frame three by three or three by four feet, placed on posts, is filled nearly full with proper soil shaken and leveled down, and the sash put on. A rag saturated with turpentine is placed in the frame, the fumes from which clear the frame of insects. The seeds are sown quite thickly in the frame; the soil is pressed down firmly and watered. As soon as the young plants have developed the third leaf most of them are taken up and reset in another frame, two or three inches apart each way, where they are allowed to grow strong and stocky. In the latitude of Georgia we risk a few plants as the first setting out March 20th to 25th, but the bulk is planted from April 5th to 15th, which is past the frost period. The soil is thoroughly plowed and harrowed, or raked; the rows are made three feet apart, and the plants are set thirty-six inches apart in the row. If cutworms are abundant, a square of paper is twisted around the stem of each plant close to the soil. The plants are set on a level, and the soil is pressed firmly about the roots. If the soil is very dry a depression is left about the plant, into which a pint of water is poured. After it has soaked in, dry soil is drawn into the hole to retard evaporation. On the first appearance of flea beetles the plants are dusted slightly with clay dust or lime sprinkled with kerosene oil or turpentine. At planting time the soil is deeply and thoroughly prepared, but the cultivation is shallow and repeated often enough to keep down all weeds and to insure steady growth.

Rank, unfermented manures should be avoided for egg plants. I have used, with great satisfaction, one part bonedust and two parts hard wood ashes, one ton per acre, broadcasted and harrowed in six to eight weeks before planting out. Protected from its implacable foe, the flea beetle, and in rich soil, with strong, healthy plants, egg plant culture is simple enough, and where there is a market for the product it is a very satisfactory crop to handle.

A DOZEN GOOD WINTER APPLES.

E. P. POWELL, NEW YORK.

Among the best apples for high quality is the Grimes' Golden Pippin. This does not give, however, a good size for shipment as grown in Central New York. It averages so much smaller than in Ohio that we cannot consider it a profitable market fruit. The tree is a model in form, and the crop sure and abundant. The wood is also very enduring, clean and healthy. The skin of the fruit is unusually delicate, so that it bears handling badly during the winter. For cooking I place it next to the Spitzenberg.

Kirtland resembles the Ortley and yellow Belle Fleur. It is probably a seedling of the latter. Its keeping qualities are remarkable. The wood is very tough, and bears without breaking such loads as are seldom seen on any other tree. When picked the fruit is peculiarly white, with some red cheeks; but as it ripens in the midwinter it becomes a rich yellow. A bin of well-sorted Kirtlands need not be looked over before April.

Jonathan, a seedling of the Spitzenberg, is an ideal apple for beauty and quality. It is an admirable keeper in a cool cellar; but like almost all small apples, shrivels badly in a warm room. In many respects the apple resembles its parent, having a fine yellow crisp flesh. As a desert fruit I should place it with Grimes' Golden. The tree is a slender and not very stout grower; but is not subject to diseases that destroy the vitality of the Spitzenberg. The trees yield in abundance, and thinning should always be carefully attended to during the growing season. It is a favorite fruit with the codlin moth, which injures it seriously.

If planting a small orchard for home use, or a large one for market, I should go back heartily to the old Roxbury Russet. For quality, richness in cooking or for dessert, not many apples equal this russet. It is a fairly good growing but spreading tree, and bears enormous crops. It is also a great favorite of the codlin moth, and will bear but small quantities of good salable fruit unless the trees are sprayed. But this is true of all high flavored fruits.

The genuine Rhode Island Greening is either hard to find or it is so affected by the stock on which it has been grafted as to be, in most cases, a comparatively inferior apple, yet the best golden fleshed Greenings are incomparably fine.

Swaar is now seldom planted, and not always to be found in market when apples are plenty. But taking all things into account the Swaar still deserves the rank given it by Downing as the standard. It is large, solid, of intensely rich flavor. It is not quite as good for a cooking apple as it is for dessert, but whoever has it will need it for the table. It keeps all winter and shows no inclination to rot. The tree with me is not a rapid or good grower, nor a heavy cropper. It inclines to sprawl. It must have the highest culture, be well mulched, and frequently washed with kerosene emulsion.

Wagner varies a good deal in quality, but at its best is so fine that I should not care to be without it. In appearance it is much like Northern Spy, but the flavor is a rich, mild acid.

Hubbardston is for some reason not so often planted as formerly. It does not keep well beyond January first; that is, its flavor is gone, even if the apple does not rot. This and the Baldwin should, if possible, be grafted on large trees. Both are rapid growers; but both break down easily with the loads that they bear.

Northern Spy enjoys the position of the most popular all around apple in America. It is always salable if in good condition, and nearly always in good demand. It grows in popularity each year. The tree is a curious grower, and if not trained with some supervision, is pretty sure to break down early. All the limbs appear to start out at one place, so as to bring the full weight of a crop to one point of the trunk. Watching the trees when small, and the free use of the knife, will so direct growth as to properly distribute the weight of the fruit.

To complete the list we need a November and December apple, and this we have to perfection in the Fameuse or Snow, the very ideal of a dessert apple. It has that delicious combination of qualities that makes it both food and drink. The two sweet apples which I need to fill out my demands are the Pound Sweet and the Belle Bonne. The former, to be at its best, should be grown in open fields; the latter is a dense, compact tree, and its fruit, which keeps all winter, is delicious.

PICKED UP ABOUT THE FARM.

E. L. VINCENT.

It is a great deal easier to do work when it ought to be done than to let it get even a day behind. Every day brings its duties. If these are neglected, or if we are compelled by circumstances to postpone them, to-morrow we must work harder and longer to catch up.

It pays to be careful in little things on the farm as well as anywhere else. Every bushel of corn is made up of separate ears. Each one wasted makes the basket so much the lighter. On many farms hundreds of dollars are lost for want of a little care. "Many a mickle makes a muckle."

The man who has time to sit by the stove in the village grocery while his cattle are shifting for themselves on the hills, working for dear life to get a nibble of frosted grass to keep them alive, is the one who blames "the government" because times are hard, and he has not money enough to pay for the farm.

This world is as good a world as I ever expect to live in. I try to make the best of it as I go. The most unprofitable thing any one can do is to complain and find fault with his surroundings. His duty is to rise up and bring things to him instead of waiting for them to come.

Success is a wary thing. It can't be caught with chaff, nor by sitting still and waiting for it accidentally to pass our way. He who seeks it must bait his hook with good, honest bait, and rise up early in the morning to drop his line in the stream of faithful endeavor. The real wishes and needs of humanity must be known.

THE LARGEST HOUSE APIARY.

W. Z. HUTCHINSON.

House apiaries present several advantages over out-door establishments. Hives and supers may be of poorer and thinner lumber, and require no paint, as they are not exposed to the weather. There is no wading through the wet grass, nor working under a sweltering sun. The hives and implements are close together, enabling the operator to do more work with less tramping about. All trouble from robber bees is entirely done away with, as no bees can gain access to the interior except those of the colony that is being handled. Bees are more amicable when handled in-doors. They can be handled in rainy weather, or even in the night if necessary. The work of protecting them for winter is greatly lessened, and artificial heat can be used if found desirable. If there comes a warm day in winter, the bees can enjoy a cleansing flight, which is not the case when wintered in the cellar. The protection enables them to build up in the spring much more rapidly; and, finally, everything can be kept under lock and key, safe from thieves and prowlers. What is admitted to be the largest house apiary in the world is owned by a friend of mine, H. P. Langdon, in Northern New York, who took a great deal of pains to inform himself in regard to the advantages and disadvantages of other house apiaries before building; and now, after two seasons' use, the only fault he finds with the building is that it is not one foot wider. This would give plenty of room for sorting and crating the honey in the house, instead of having a separate house for this work. The building is eleven by one hundred feet, and stands on a good stone wall, having ventilating openings on each side. The sills are two pieces of two by four; the lower joists are two by eight, two feet apart from center to center, and the same distance as the studding. The floor is double, of seven-eighths lumber, planed, with a strip of sheet iron between the layers next to the wall and around the studding, to prevent mice from gnawing up through. A platform twelve inches high and the width of a hive extends lengthwise of the building in the center of the room, except that a space of eight feet is left at each end, and a space of six feet in the middle. This platform is for holding extra hives, supers, etc., that the alley on each side may be left clear. The studding is two by four, and of such a length as to make the top of the plate—two by four, two pieces—come eight and one-half feet above the floor, and the upper joists, one and one-half by eight, are nailed across the rafters one foot above the top of the plate, thus making the room nine and one-half in the clear. The roof has the common pitch and is well shingled. A few braces are put in to keep the building from shaking in high winds. The boarding is a second quality of spruce, made shiplap, and put on horizontally.

On the floor at each side of the house is a platform the whole length of the room, three inches high and three inches wider than the length of a hive. This platform is permanently stuffed with planer shavings. A plain hive with square corners and flat top is used. The hives stand on this platform, flush with the inside edge of the studding sidewise to the wall, two feet from center to center, thus bringing the ends only three and three-fourths inches apart. The entrance to each hive passes through the outside boarding nearly on a level with the floor, then rises on a slant to the top of the platform, and opens into the hive four inches from its outer side. This leaves a space for dead bees to accumulate, so that no rim is needed under the hive in winter. Over the space between the hive and the wall, level with the bottom of the hive, is a loose cover with an inch hole in it. Then over this, nearly to the top of the hive, is another cover, resting on cleats on the studding. This forms a sort of box four by twenty-two, and nine inches deep, between the hive and the wall, and makes a very convenient place to get rid of bees that must be shaken off the covers, combs and other things. By tipping this upper cover back against the wall, shaking in the bees, dropping the cover in place and letting them go down through the inch hole and up into the hive at their leisure, one troublesome feature of most house apiaries is avoided. These platforms provide for one hundred hives. Above these platforms, four and one-half feet from the floor, is a shelf, formed by nailing an arm of inch stuff on each side of each studding, with a brace, two by four by twenty-four, nailed between them and their outer ends, and spiked on the edge of the studding below. These brackets are floored over exactly like the lower platform, entrances and all, and packed for winter in the same way. The windows consist of one light, fourteen by twenty, with the sash set into the wall without casings, and screwed to a cleat on each side, that is nailed inside the boarding. There is a window in front of every third hive. A hole is bored through the top sash close to the edge of the glass, and around each opening the wood is cut away inside, to lead out all bees that fly to the window. Just above the level of the cover of each hive is a two-inch hole bored through the wall, with a wire cone in each. These are the bee escapes proper of the house. All windows, except the one nearest the hive being manipulated, are curtained quite dark, otherwise the bees do not leave the room well. Upward ventilation is obtained

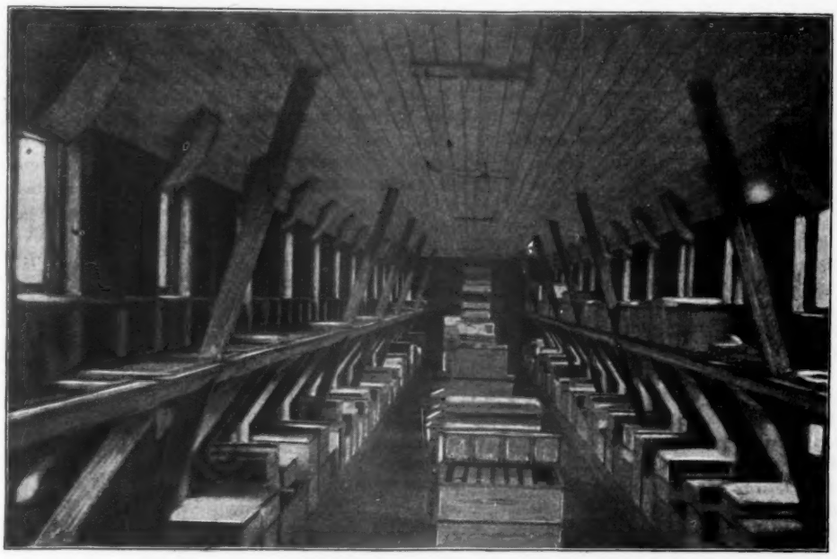


Fig. 1. INTERIOR VIEW OF APIARY.

Fig. 2. PERSPECTIVE VIEW OF APIARY.

by three shafts, eight by eight, through the ceiling and roof, into a cowl over each on the roof. Both these and the openings below can be closed in the winter. The draft is so strong most of the time that it will draw up a piece of paper, consequently no trouble is experienced by reason of smoke in the room.

The outside walls are painted in five different colors, of as great a contrast as could be made, six feet of each color in rotation. This brings a window of each upper and lower row into the center of each color, also three entrances to each color, and works admirably in helping the bees to locate their hives. Each entrance has an alighting board of the same color as the wall above. For wintering, a cleat five and one-half feet long is screwed to the edge of the platform and shelf, with a wide board running lengthwise on the inside. This makes four troughs one hundred feet long, with fifty hives standing in each. Planer shavings are then packed around the hives, both sides and ends and over the top, and the bees are ready for winter. [Our engraving Fig. 1, on the preceding page, presents a view of the interior of this extensive house apiary; and in Fig. 2 is shown a perspective view of its exterior.)

POTTING AND REPOTTING PLANTS.

LENNIE GREENLEE, PENNSYLVANIA.

Many amateur florists find it easier to repot their plants in spring, and plunge them in the garden, than to plant them out in beds, and lift them again in autumn, for the latter, if not done carefully, so as not to bruise or cut the roots, is apt to check plant growth and cause the buds to blight or droop. Every provident gardener keeps on hand a good supply of potting soil for such times. It is a mistake to suppose that every species, or genus of plants needs a particular kind or mixture of soils. Some sorts, indeed, are rather whimsical, and must be indulged in this way, but a compost in which the majority of house plants thrive well, and which may be easily procured, is composed of sods cut from the roadside or an old pasture and piled up in a heap to decay, together with about one-fifth part each of manure, leaf-mold and sand, until the whole is a soft, crumbling, fibrous mass of rich earth. Separate heaps or bins of pure sand, leaf-mold, and peat, or sphagnum, may be kept to prepare special composts for more fastidious plants, if the gardener elects to grow them. Usually the finer and more fibrous the roots of such plants are, the more sand and leaf mold should be added to the compost to make the soil light and porous. Plants with large, thick, fleshy or woody roots, as a rule, require especially good drainage, but are not so particular in regard to soil.

The pots used should always be clean and of a size proportionate to the balls of roots which are to be placed in them. The majority of plants grown in window gardens would grow and bloom much better if given smaller pots. It is best to choose sizes which are just large enough to hold the roots, with an inch of fresh soil all round them after the drainage has been put in. Six and eight inch pots are large enough for most house plants to bloom in the first season; the repotting done afterwards must be governed by their growth.

Drainage is an important item in the culture of all plants. All sorts of coarse material are used for this purpose, but bits of broken charcoal are better for this purpose than anything else, because it helps to keep the soil in the bottom of the pot sweet and healthful. The smaller sizes of pots will need only a few pieces scattered over the bottom; three and four inch pots require an inch of drainage, and five and six inch sizes and upward, two inches and more, according to their depth. A layer of moss or cocoa-fiber should be placed above the drain to keep the soil from washing down into and clogging it.

Plants are frequently potted too high or too low. In the first case they are likely to suffer from lack of water, which runs off the surface before it can soak in; in the second, the roots will be cramped for room which is wasted above the surface. In potting, put an inch of soil upon the drainage, and spread the lower roots of the plant in a natural position upon it, holding the stem so that the upper roots are an inch below the rim of the pot; fill in the soil with the other hand until all the roots have it packed closely around them, and the surface of the soil is even with the crown of the plant. A thorough watering is now in order, and if the plant shows any sign of wilting it must be shaded for a few days.

All plants do not require yearly repotting; some need it twice or half a dozen times a year, as will be the case in growing plants from seeds or cuttings to blooming size. It is easy to find out when such plants need repotting. Spread the fingers of the left hand over the surface of the soil, and turn the pot top downward, rapping the rim sharply once or twice upon the edge of a bench or table. This will leave the mold of earth and roots upon your left hand, and if the roots are crowded they need a pot one size larger. Old specimen plants which do not need repotting should be top-dressed yearly with well-decayed manure or rich earth.

INFLUENCE OF LOCALITY ON GRAPE CULTURE.

DR. R. W. BATTLES, NEW YORK.

It is well known that the southern shore of Lake Erie is eminently adapted to grape culture, and yet there are few vineyardists who ever seek to understand why this is so. It is patent to the most superficial observer that grapes cannot be raised in certain places. Localities where the dew-fall is copious and frequent are unfitted for successful grape growing. The excess of humidity predisposes to black rot and mildew, two of the greatest foes to successful grape culture. Trellises that have been roofed over, protecting the vines, have fruited and been free from disease in these localities; but, when the vines were exposed, they all suffered from black rot and kindred diseases to such an extent as to be a total failure. It would therefore seem that the best grape climate would be where dews were light, and investigation will show that where grape culture is extensively and profitably followed, it will be in such a locality.

Proximity to large bodies of water, or a certain elevation on hillsides, indicates such favorable spots. The ameliorating effect on climate of large bodies of water is so well known as to need no comment. This is peculiarly applicable to Lake Erie. Being by far the shallowest of all the great lakes, its waters become very warm in summer. The heat stored in this vast reservoir is steadily radiated all night; the direct effect of this is not only noticed on the banks of the lake, but extends inland for many miles. This has a decided effect on the dew-fall, and also wards off early autumn frosts. The lake shore grape district has the kindly influence of Lake Erie, and the latitude is such that the wood is fully matured, and the power of resisting cold depends much upon this fact. Wood fully matured will stand very low temperature, but wood that has made its growth late in the season and is full of sap and immature easily succumbs to cold weather. The grape belt along Lake Erie is about eight to ten miles in width. Back of this the country, although of equal fertility, and even further south, is subject to early frosts in fall and late in the spring. In certain localities where the ground is very stony grapes do well. The stones being heated by the sun's rays, radiate heat during the night, thus keeping off the fall of dew.

For the amateur grape grower these facts are full of interest, for success will depend more on locality than on the care of the vineyards. In any locality where mildew or black rot occurs grapes cannot be raised without the expense and vigilant use of Bordeaux mixture and other preventives. At the present low price of grapes, any great, or even a moderate use of such measures, may absorb the entire profits of the crop. Even in the most favored locality, frequent and heavy rains during the summer and autumn will cause the appearance of an occasional black rot or mildew.

A VALUABLE GRASS FOR THE SOUTH.

EDWIN MONTGOMERY, MISSISSIPPI.

The tall meadow oat grass, *Avena elatior*, is a most valuable grass, and deserves more general cultivation at the South. A close relative to the oat, it is widely naturalized in this country. It is one of the few cultivated grasses that thrive well on sandy upland, but will not stand much excess of water. This grass will do very well on a variety of soils, though sandy land suits it best; it is a hardy plant and stands both summer drouth and winter cold about equally well, and is not less valuable for its large and valuable quality of hay, than for the enormous amount of early and late pasturage it affords. It is sometimes called Evergreen grass, owing to the fact that it is green the year round, winter and summer. The hay is very nutritious, and two crops can be had in a favorable season. The height of plant is from five to seven feet, and is excellent for soiling purposes. The seed should be sown in March or April, September or October. The grass grows in tussocks, and, hence, heavy seeding is required—about two bushels to the acre. This grass is not so hard to get a stand of, as is the case with most of the cultivated grasses. The seeds ripen while the stalk is green, and, hence, both a seed and a hay crop can be saved. Several parties have stated that if they were restricted to one grass they would choose Tall Meadow Oat Grass, because of its many good qualities

SUB-IRRIGATION FOR FORCING HOUSES.

A. C. HENRY.

Sub-irrigation for truck farming and in forcing houses has been on trial for several years at the Ohio State University. The trials were begun in the greenhouse, the middle benches being seven by eighty-four feet, and the side benches four by ninety feet. These benches are water-tight, and the soil forming the beds about five or six inches deep. Two and one-half inch drain tiles were laid lengthwise of the beds and in rows about three feet apart, the joints of the tiles being cemented at the bottom. At one end of the bed the last joint of tile protrudes, and is inclined. Into these end-joints water may be forced with a hose, or poured in. The water flowing through the tiles passes out at the joints and enters the soil. An ordinary greenhouse bench can be easily converted into a water-tight bench by giving the bed boards one or two coatings of cement mortar. This makes a less costly bench than one built of first-class lumber. Either will last twice as long as the usual loosely-constructed greenhouse bench. Lettuce seed is sown in small, square boxes about two inches deep, the bottoms of which are made of ordinary lath laid as close together as possible. These little boxes or squares are placed in one of the empty benches, from which a former crop has been taken. Water is turned into the bench, and the soil containing the seed gets its moisture from the water finding its way through the laths on the bottom of the little boxes. In about a week, when the first leaf is formed, the plants are transplanted to similar boxes, but in heavier soil, placing about seventy plants to the box. They remain there six weeks, and are then transplanted to the bed in a bench. Up to this point it will be seen that while sub-irrigation has been used, no tile has been employed, lath bottoms being the substitute, and the flats are set in water for a time. In sub-irrigation the beds are watered through the tile only once in ten or twenty days, while surface-watered beds are watered every other day at least. Three crops of lettuce per year are grown in the forcing house, the seasons being Thanksgiving, Christmas and February. Last winter all the lettuce houses were watered by the sub-irrigation system, except a few plots left for comparison, and the result showed a gain in weight of thirty-seven per cent. over the old method of surface watering, while with radishes the gain was two hundred and fifty to three hundred per cent.

One of the advantages of sub-irrigation is that all the water goes directly to the roots of the plant. The bottom soil is kept wet, and the moisture is prevented from escaping by the dry top soil. There is also absolute freedom from fungus diseases. The forcing house is not in a constantly damp condition. It is also a noticeable fact that radishes do not run to big tops and weak bodies, but just the reverse. The house is fumigated with tobacco dust by putting it in a pan or other vessel and lighting it. The tobacco is kept smoldering all night, but is not allowed to blaze. About five quarts of tobacco dust are used for every one thousand feet of space, in order not to get an overdose, which would kill the plants. Red spiders did not trouble the greenhouses last year, though the walks about the houses abounded with them. In watering, the hose is left in one tile for a half hour, and then changed to another. Where a cement bottom is used, the tiles are cemented.

NEW SEEDLING CARNATIONS.

F. H. PLUMB.

In but few kinds of florists' flowers have there been made as decided improvements as in carnation pinks. Prominent among recent introductions is the Nicholson carnation, originating with William Fisher, of Framingham, Mass., who has had good success as an originator of new varieties. He introducd the Mrs. Fisher, one of the best white carnations on the market to-day. The Nicholson is a cross between the popular Grace Wilder, a pink carnation, and the Mrs. Fisher. Two years ago Mr. Nicholson obtained a number of unnamed seedlings from Mr. Fisher, and among them were two of unusual promise. One he called Nicholson, the other Ada Byron. The colors of the flowers of the Nicholson are of a pleasing shade of pink and are strongly scented, large and full. They bring a fancy price in the Boston market, where they are readily picked up by those acquainted with their worth. The plants are strong, robust growers, and entirely free from the carnation rust, so fatal in some varieties. It is a beautiful rose-pink, like Gabriel, and very fragrant. The flowers are carried on long, stiff stems and beautifully fringed, the individual flowers measuring from three to three and three-fourths inches across. The Nicholson took the first premium at Springfield, Mass., last year, also a first-class certificate of merit and the first premium this year, for best vase of carnations. It was awarded the first premium in New York City for the best fifty blooms of pink carnations at the last chrysanthemum show, and also a first-class certificate of merit from the Massachusetts Horticultural Society, at its last chrysanthemum show. [The flowers to the left in our engraving present an excellent illustration of the Nicholson carnation; those to the right represent the Ada Byron.]

NICHOLSON AND ADA BYRON CARNATIONS.

Improvement in Wool Sheep.—The average weight of fleeces has doubled within the last thirty-five years in the United States. This is due to the fact that sheep have been better bred and more intelligently managed than they were a generation ago in America.

QUALITY IN STRAWBERRY PLANTS.

C. L. HILL, MINNESOTA.

In planting a strawberry bed, large or small, it is well to give careful consideration to the fact that an amount of work necessary to its care will be just as great on poor soil as on rich; just as great, or even greater, if the plants set out are inferior as though of the best stock. But the yield will be widely different under these varying conditions, hence it is the poorest kind of policy to plant on poor soil, or to use inferior plants.. There are two kinds of plants that are extensively used, which are really unfit to be placed in a strawberry bed. There is no doubt that the use of these annually reduces the crop considerably.

When an old bed has outlived its usefulness there are thousands of apparently good plants to be plowed under. Some persons cannot bear to see these go to waste. So they either use them for starting new beds, offer them for sale, or give them to their neighbors and friends. Whoever tries to save something by the use of such plants is likely to lose in the end ten times as much as he seeks to save. Another practice not uncommon among fruit growers is to take plants from the edges of the matted rows of the bed that is to bear fruit. As they wish to disturb the bed as little as possible they take the plants that have run farthest into the central spaces between the rows. They claim that such plants must be all right since they come from beds of last year's setting, and which were not allowed to bear fruit. But they are as unfit for use as the old plants taken from the wornout bed, as they grew from sets at the ends of the runners, too far from the parent plants. When a runner has grown for a short distance it forms a set. Whether this takes root or not, the runner continues for another short space and then forms another set, and so on until the third, fourth or even fifth set is formed, all more or less dependent on the parent plant for their support and growth. Those nearest the parent plant have the best chance. They make more rapid growth and become stronger and better plants than those farther removed, while those at the very ends of the runners, the last feeble effort, are of low vitality and feeble growth. Besides they are formed so late in the season that they do not have time to get properly rooted before winter sets in. To fill a bed with such plants is to make a very poor beginning, and spoil all hope of anything better than a light or medium crop.

The proper kind of plants to use in starting a strawberry bed are those grown the previous year expressly for transplanting. In growing plants for such purpose, extra pains are taken in training and pruning the runners so that only the best plants are preserved, and so few of these that no two shall stand closer than five or six inches apart. The late-forming sets and runners are cut off, so that when winter sets in the bed is composed wholly of strong, well-matured, well-rooted plants. When wanted in the spring, the entire row—not the edges of it—is taken up, and a choice grade of plants is thus secured. Better pay an extra price for such plants than to take inferior ones as a gift.

THE DAHLIA FOR SUMMER AND FALL BLOOMING.

E. E. REXFORD, WISCONSIN.

The old double dahlia is still a very popular flower. It deserves to be, as we have few finer ornaments for the garden than a large plant covered with great blossoms of rich and beautiful colors. But those who take into consideration gracefulness of habit will prefer the single kinds and the cactus varieties. Both of these lack the stiff, firm, formal appearance which characterizes the old double kinds. We have few finer flowers than these for use in large vases. Their long stems and nodding flowers make them extremely effective. They have all the rich colors common to the double kinds, and are as free and constant in blossoming. When well grown, dahlias are sure to please. If not well grown, they are extremely unsatisfactory. Because many persons fail to grow them well, the impression prevails that they are rather difficult to manage. This is not the case, however. The requirements of the plant should be understood before undertaking their cultivation. Understanding these, any one can go to work intelligently, and be reasonably certain of success. The dahlia comes to us from Mexico, where the summers are long. The summers of the Northern States are comparatively short, and if we wait until settled warm weather comes before planting our dahlias, they are pretty sure to disappoint us. They will be just coming well into flower when frosty nights are at hand, and a slight frost is sure to ruin them. It will readily be understood, therefore, that in order to bring the plants into bloom early in the season, it is necessary to start the tubers into growth before it would be safe to plant them out of doors. This can easily be done by planting them in pots and boxes, in any frost-proof room. I generally start mine about the middle of March. If not kept in a very warm place they make a stout, healthy growth. If kept too warm the growth will be weak and spindling. The beds in which they are to be planted should be dug up to a depth of at least a foot and a half, and made very rich. The dahlia is a gross feeder. You can hardly give it enough rich food to suit it. Use old, rotten barnyard manure, mixing it well with the soil. Work it in well, until you have a mellow place for the plants. Let the location be warm and sunny, if possible, and plant only one tuber in a place. Shortly after planting set a stout stake by each plant. It is well to do this early in the season, as you may injure the young roots if you wait until the top seems to require support. Tying the plants well ought not to be neglected, as the stalks are very brittle, and easily broken by a sudden wind.

If you want fine flowers, and plenty of them, you must use a great deal of water about your plants. Indeed, you can hardly give too much. The best plants I had last season were given two or three pailfuls of water every night, all through the summer, except in rainy weather. If you do not water dahlias, in ordinary soils, you can not expect to find out what they are capable of doing. Keep the ground very moist all the time and you will have magnificent flowers, and great quantities of them. Plants will frequently be six and eight feet high and as many feet across, provided the soil is rich. Save all the slops and soapsuds from washing-day to pour about them. They are not fastidious as to food. All they ask is, that there shall be plenty of it.

The three important items in successful dahlia culture are these: 1st. An early start. 2d. A very rich, mellow soil. A sandy loam seems preferable. 3d. Plenty of water all through the season. Cut the flowers freely. By so doing you increase the supply, as the plants are persistent in their efforts to form and perfect seed. They must be kept from doing this if they are to blossom large numbers of flowers up to frosty weather.

FEEDING BARLEY STRAW.

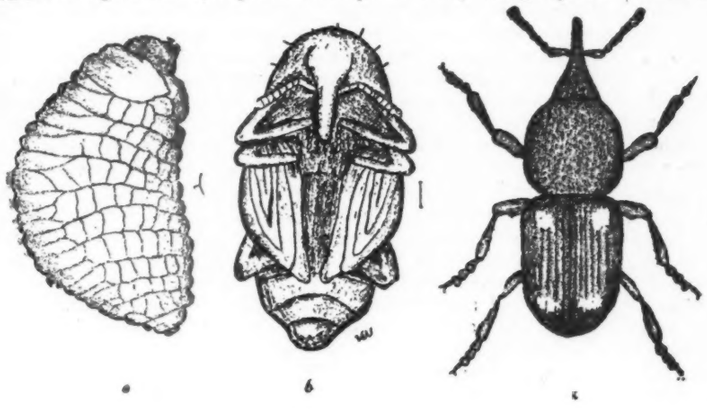
Barley straw, when the crop is secured in good condition, should come from the thresher bright colored and well broken up by the action of the threshing cylinder, and if the beards are wholly or partly removed, no danger need be apprehended in feeding to any stock. This removal is easily done at threshing time by allowing the chaff from the sieves to fall to the ground, or by leaving a one-and-a-half-inch space at the joint in the straw carrier through which the beards and chaff fall to the ground. In either case only the straw passes to the stock. The beards and chaff are readily eaten by stock, and if run through the cutting box, dampened and sprinkled with a pint of meal to a bushel of chaff a very palatable feed is obtained. Sheep relish the bright barley straw, but it should be fed from a rack with closed sides with an opening only at the bottom, otherwise the beards become thoroughly imbedded in the wool about the head and neck. Cattle and other stock that are fed on the straw in the open air often get a piece of beard between the eyelid and ball, causing intense pain and serious inflammation. This impediment is easiest removed by throwing a little powdered salt in the eye, causing a copious watery discharge to carry off the troublesome particle. In feeding value barley ranks next to oat straw, and in most cases is superior to it, especially if the oat straw is of a heavy growth, or affected with rust, as is often the case.

Sharpening a Cast-Iron Plow Point.—Many farmers are not aware that when a cast-iron plow point has become very dull, or even thrown aside as worthless, its usefulness can be prolonged, for the plowing of one or two more acres in common soil. Remove the point from the plow, and if there is no stone as large as a man's head, drive an iron wedge partly into a log, or post, or even use an axe, or other piece of iron, the object being to obtain a solid surface to strike against. Take the point, bottom up, in the left hand, resting it upon the stone, or iron near the point, then with a hammer strike a quick, angling, downward blow, just chipping off the point. These blows will not break the iron at right angles, but chip it off, sometimes in pieces the size of a quarter of a dollar. Extend this chipping process all along the cutting surface underneath the mold board. Practice on an old point, as it requires considerable skill to properly strike even such an inanimate thing as a plow point. Chip the points before they are too badly worn.

GRAIN INSECTS AND THE REMEDY AGAINST THEM.

HOWARD EVARTS WEED, MISSISSIPPI EXPERIMENT STATION.

An article upon the black weevil has recently been making the rounds of the press expressing the fear that this insect would become introduced in the United States by the distribution of the grain which was exhibited at the World's Fair from foreign countries. While this fear, to a certain extent, is well founded as regards the introduction of species new to this country, yet the black weevil has long been known with us. Toward the close of the Fair an agent of the Division of Entomology inspected the grain in the foreign exhibits, to prevent the spread of any foreign species



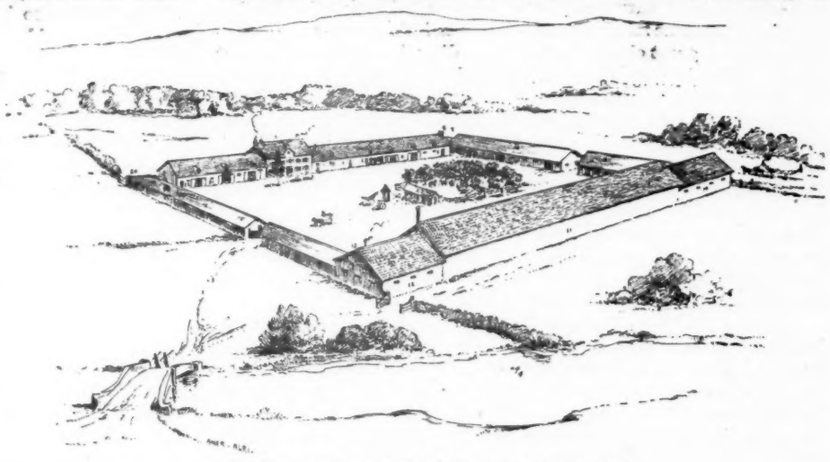
LAVA. PUPA. MATURE BLACK WEEVIL.

new to this country. The efforts of the division in this regard are to be commended, and the measures taken may prevent, in a measure, at least, the introduction of injurious foreign species.

By far the worst grain pest in the foreign exhibits at the fair was the black weevil, an insect which may be said to be world-wide in its distribution. While the Fair may have been a means of distributing this species in some of the extreme Northern or Northwestern States where it has heretofore been perhaps unknown, but little danger may be apprehended in this direction. The black weevil does little or no damage in the North, but in the South it is ever present, doing more damage to stored grain than all the other species combined. It is doubtful if this species will ever do much damage in the Northern States, certainly not to such an extent as in the Southern States. The mature form of this insect is shown at *c* in the accompanying illustration, the line at the side showing the insect's natural length. It is a small black beetle, having four reddish-colored spots upon the elytra, or wing cases. The eggs are laid within the grain and hatch into small, light colored larvæ, which feed upon the more tender portions. When mature, a larva has the appearance as shown at *a* (much enlarged), being a fat, footless grub of a light yellow color. In about ten days after hatching the larvæ change to pupæ (*b*) within the grain, and in a few days later the mature weevil (*c*) will emerge and eat its way to the outside of the grain. Thus but a short time, about three weeks, is required for the insect to go through its transformations, and this accounts, in a large measure, for the immense numbers in which these weevils appear. The species attack corn, rice and wheat especially, both in the larval and adult states. It does such damage to rice that in the East Indies it is known as the "rice weevil." But little idea can be formed of the immense damage done by this insect by one who has not seen the results of its work. In Mexico, for example, corn can be grown very easily, requiring but little or no cultivation, yet it cannot be kept three weeks after harvest on account of the black weevil. In Louisiana the rice crop is greatly reduced by its work, while throughout all the Southern States the annual production of corn is greatly lessened. In Honduras, I am informed that rice which is free from weevils sells at a great advance over that which may contain weevils. While this species is often very destructive, an excellent remedy for its destruction is found in bisulfid of carbon. This is a volatile liquid, the fumes of which are destructive to insect life. The use of the bisulfid for grain insects was first recommended by Dr. Riley in 1879, and since then it has gradually been coming into favor as a remedy. To destroy the black weevil, or other species which may infest stored grain, the grain is placed in a tight bin, and the bisulfid simply poured over the top. About an ounce of the bisulfid to the hundred pounds of grain is generally used. Recently there has been placed upon the market a much stronger product than the commercial grade of bisulfid, known as the "fuma" bisulfid. This has fully twice the value of the commercial grade, and on this account should be obtained for the treatment of stored grain insects. While the bisulfid of carbon is an explosive substance, there is no danger in its use if any care is taken to keep it away from lighted cigars, matches, and the like. Grain insects are also often very destructive in grain mills, sometimes, indeed, the mills are overrun with these pests. Here, again, the bisulfid is an important remedy, for, by a little attention, and with but small expense, the mills can be cleared of the insects. In the applying of bisulfid in mills, it is important that the application should be begun in the basement of the mill and continued to the top, for the fumes are heavier than air, so that if the work was begun at the top floor, the fumes would prevent thorough application being made below. American corn should in all cases be husked before treatment, as the husk affords such protection to the insects attacking the grain that a much larger amount is necessary in the treatment of the unhusked maize than would otherwise be the case. The action of the carbon bisulphid is still more effective if the corn is shelled. This black weevil, *calandra oryzæ*, Linn., is probably a native of the East Indies, where for nearly a century it has been a well-known pest. The insect has been found in the grain in the field, but it does the greatest damage after the grain has been gathered. It is very destructive to maize in Mexico. The meal or the flour made from the infested grain is considered very injurious to the digestive organs.

A MODEL FRENCH FARM.

In the agricultural building of the Columbian Exposition at Chicago was an exhibit which attracted much attention, as it gave a glimpse of French farm life. It was a model of the buildings of



BIRD'S-EYE VIEW OF THE D'ARCY FARM, FRANCE.

the D'Arcy farm of eleven hundred acres, the farm and relative proportions being accurately reproduced. Our illustration represents the model as it appeared at Chicago, and is, therefore, a very accurate picture of the farmstead as well. The buildings surround a quadrangle, the principle structure being the dwelling of the farm manager and the hands employed. It is marked (1) in the engraving, and a two-story and attic building, resembling in outward appearance many an old-fashioned farmhouse in the United States. Adjoining it are the eating rooms (2) where the farm hands partake of the coarse fare generally accorded to them in France. Conveniently adjacent are the dairy rooms and refrigerators (3), where the butter is made and stored. Adjoining, and under the same roof (4), is stabling for a limited number of milch cows, the principal stables being more remote from the living apartments.

Next are the rooms (5) where the dairymaids find lodgings discreetly remote from the other lodging rooms. At a right angle with the above is a long, low stable (6) with accommodations for fifty-four cows. Separated from it by an alley is a hospital (7) for cows in sickness or calving. The space at the angle is utilized by a neat little pigpen for the boar (8). To the right, as one faces the hospital, is stabling for fifty-four cows. Stretching across the third side of the quadrangle, and occupying nearly its whole width, is the grange or main barn (11), flanked on one side by a stable for thirty-six cows and steers (10), and on the other by the granary (12). A portion of this structure (13) is fitted up with apparatus for storing and cooking food for the stock. The fourth side of the quadrangle is pierced by the alley which forms the main entrance and is largely occupied by wagon sheds (14 and 16), and a coach or carriage house (17). The business office, where the accountant has his quarters, abuts (18) directly on the main entrance. Adjoining the carriage house is a small stable (18), handsomely fitted up for the accommodation of five horses, and next to that is a blacksmith's shop (19). The adjoining angle, like the opposite one, is occupied by a pigpen (20), only this is large enough for the entire herd, and is divided off into many compartments. Turning the angle and continuing forward we find first a harness shop (22), and still another stable with stalls for twenty-six cows. This completes the quadrangle, closing it in on all sides, except for the two alleys for entrance and egress. Near the center of the grounds and detached, stands the poultry house (23), with a quaint pigeon house in its front. It will be seen that in the arrangement and plan of the buildings the aim was solely for utility and convenience, with no attempt at the picturesque. In its way it is a model farmsteading. The grouping is such as to save steps, and every thing is brought under the eye of the manager. The structures, though comparatively inexpensive, are substantial and durable.

THE IDEAL COUNTRY HOME.

MRS. M. P. A. CROZIER, MICHIGAN.

As long as the best crop that can flourish in the country home is its crop of boys and girls, so long will it pay to give attention to the beautiful. As Victor Hugo says: "The beautiful is as useful as the useful; perhaps more so." One does not need to call the attention of the thrifty ruralist to the fact that a fertile soil is necessary to the growth of his wheat and corn; he learned that as an elementary principle. But that children must strike their roots into anything but barren sands would seem to have made little impression upon some minds. Yet through the influence of the agricultural press, a great change in the right direction has been brought about. Many country homes are now showing the development of an esthetic taste as gratifying as it is valuable. True, the ideas expressed are often extravagant or crude, showing imperfect culture, or the restriction of limited means may be painfully apparent; but there is progress. Perhaps comparatively few have advanced to the high place whence they can see that "beauty is its own excuse for being;" but some have learned that it has a money value. Hence they no longer plant the potato patch near the front door, or grudge the wife and daughter a little "posy-bed;" and they have pride enough to cut the weeds down and banish the yard rubbish to a distance from the dwelling.

Almost the cheapest thing that grows is grass. But what more beautiful than a wide stretch of close-mown greensward, dotted here and there with groups of trees? Let it be cut with a lawn mower if possible, or pastured, or even left to grow, if need be, till haying time. The hot suns of July and August may turn it brown; but in spring and early summer, and in the cool autumn time, it will be fresh and green. On a farm of twenty acres or more, let there never be less than one, and much better five, acres in ornamental grounds. These may include as features, small orchards and a little meadow, or a bit of pasture ground. For that a thing is what men call useful does not preclude its being ornamental.

Not every one may choose the site of his country home. But where this is possible, if he can secure a few well-grown, native deciduous trees, and evergreens which have been properly cared for and are not far from the house, and a pretty brook or small creek, he will have, as it were, a background for his rural landscape. But the evergreens should not be crowded closely around the house. When they succeed well, a dozen Norway spruces to the windward, artistically grouped, and branching to the ground, add much of comfort and of beauty. But we do not want them in straight, stiff lines, unless it may be as a windbreak at some distance from the dwelling. They shut out sun and air, and do not look so well. If the evergreens are at one side, a few large-flowered varieties of the peach, planted in front of them—to be removed as they become misshapen—will add a lovely touch of color when in bloom. The hemlock spruce, when young, is very beautiful; give this a somewhat sheltered place. The arbor-vitæ, kept low and properly trimmed, makes a pretty hedge, and to furnish indoor decorations there is nothing finer among northern evergreens. The Austrian and white pines and the red cedar offer variety in form and color.

But do not let the evergreens monopolize your grounds. Plant near some of them our beautiful sugar maple, that the golden autumn foliage may be framed in living green. An elm standing near the water's side and leaning over it a little, its great body dividing toward the top, and its branches spreading wide and drooping low, is a most beautiful object. A weeping willow, too, bending over your "brawling brook" is very picturesque. The black walnut makes a fine tree. For all its rapid and sturdy growth and its beautiful flowers, the tulip tree lacks in grace. The common beech, with its peculiar arrangement of branches, its fine foliage in summer, and its autumn coloring, should not be forgotten when you plant your grounds. From the time when in spring it displays its corals, till in autumn its crimson splendors glorify the landscape, the red maple is a tree to delight an artist. It may be well to have now and then a poplar, in spite of any tendency to sprout. A weeping specimen, with its leaves all a quiver, is lovely. The sumach, often so very beautiful in autumn, and unique at all times, has this bad sprouting habit. In summer, when everything is green, almost any tree or shrub is beautiful; but in early spring we may prize the early trees, and in fall those that gather gorgeous robes around them before the winter sleep.

Unless crowded for room, I would never plant a common fruit tree in front of the house. Let one spot be sacred to beauty, with no thought for other usefulness. But at the side, with room for development, a single apple tree may become one of the finest ornaments. I know of a Rhode Island Greening which is a lovely picture when in bloom; its large dome covered with its simple white flowers. The apple also holds its foliage persistently till very late in the season, and may well furnish a background for small trees that color up well. Some, at least, of the improved crab apples are very fine, and may well be cultivated for ornament alone, while for fragrant and delicate bloom perhaps the wild crab can hardly be excelled. And in gathering the treasures of the native woods around the house, do not forget the sassafras; and for draperies the feathery clematis, the Virginia creeper, and the bitter-sweet; and if you chance to have a choice, shady place that you can enrich with woods mold, transplant a group of native ferns.

STARTING A FRUIT GARDEN.

DR. GEO. G. GROFF, PENNSYLVANIA.

Fruit may be cultivated with success in almost any situation except in wet soil. Hence, where there is a choice, a piece of ground somewhat elevated should be chosen, preferably sloping to the south and east. Protection from cold winds should also be sought. Sterility of soil is no objection where fruit-growing is the object. But where one lives in a town or village, and has no choice but to take a portion of the garden plot behind the house, he may console himself with the reflection that fruit trees and vines often do remarkably well in just such situations, often giving results which cannot be realized in the open country. If the soil on the site which must be used is wet, it can probably be drained, and so made suitable for fruit trees. A garden already in cultivation needs no special preparation, except a liberal coating of fertilizer. The more deeply the soil is plowed and the better it is fertilized, the more rapid the growth which may be expected.

The situation should be carefully studied by the young horticulturist. He should make a plan, on paper, and mark where every tree and bush is to be planted, and this plan should be studied long and carefully until he is quite sure that he has it arranged to suit him. It is best to lay out a garden long and narrow, as this gives a great saving of time when cultivating by horse power. Thus an acre plot would be nearly four hundred by one hundred and nine feet; a half acre three hundred by seventy-two feet, and a quarter acre almost forty-five by forty-five feet. Now placing all rows eight feet apart, the first garden would have thirteen rows, the second nine rows, and the third six. Lay out rows north and south, to give the plants the most sunlight. Trees should never be purchased of unknown agents. The best plan is to deal directly with some reliable nurseryman. Lists should be made out early, that one may secure the best stock, as all bills are filled in the order

received. The list should contain plants ripening at different times, so as to cover the whole season. Young and thrifty trees are to be preferred to older and larger ones. All plants should be strong, well rooted, vigorous and clean, and adapted to the climate in which planted. Cheap trees of any kind should never be planted.

We may safely plant in either spring or autumn. The ground should not be wet, but dry so that it will not adhere to the tools. Large holes should be dug for each tree, the subsoil being placed in a heap apart from the surface soil. The ground in the bottom of the hole should be well loosened. The tree to be planted should then be examined, and all broken roots cut off with a sharp knife. The tree should then be set in the hole so that it will stand at the same depth as when in the nursery, or a very little deeper. The fine surface earth should be thrown in first and carefully tramped about the roots, so as to exclude all air. The subsoil is placed about the tree last of all. Never put any sods or manure directly upon the roots. If the soil is properly compacted, staking is unnecessary. Nor is it necessary to place water in the holes at the time of planting, unless the earth be very dry. Keep the roots moist all the time until ready to plant each tree. Never expose the roots to sun or wind, but keep them well covered.

APRICOT ORCHARD IN SANTA CLARA VALLEY, CALIFORNIA.

APRICOT CULTURE.

I. H. FICKEL, CALIFORNIA.

The apricot is rapidly attaining an important place in the fruit supply of the United States. There are a large number of varieties, of which the principal ones grown in California are: Royal, Moorpark and Hemskirke. The last named is a good bearer, but when there is a heavy crop of other varieties, usually brings a low price.

Before planting the trees, the ground is thoroughly plowed and pulverized. They are usually planted twenty feet apart. This gives one hundred and eight trees to the acre. Great care is taken in pruning to keep the tree in uniform shape. After the first rains have fallen the ground is plowed to a depth of six to eight inches. It is then cultivated at intervals until the fruit is nearly ripe. Some of the best kept orchards are in as fine a state of cultivation as a garden. The apricot usually blooms in Santa Clara valley during March and April, and ripens in July and August. When the trees are very full of sets, thinning must be resorted to, as otherwise the fruit could not be sold at any price. Some orchardists irrigate, but when this is once begun it must be continued each year, or the roots form so close to the surface of the ground that it is sure death to the trees when discontinued. Irrigated fruit, though larger, never sells for as much as non-irrigated, for the reason that it contains a larger amount of water, and is not as fine flavored.

When the fruit has become a deep, golden yellow color, and soft to the touch, picking begins. The tree is usually gone over three times. This generally occupies two weeks. Boxes holding forty to sixty pounds, are distributed through the orchard. A large number of the pickers are Italians and Chinese. They usually camp in the orchard during the picking season. The crop is disposed of by shipping to Eastern markets, or by canning and by drying—the larger amount being dried. Canneries are usually located near a town, so that help may be easily obtained. Large numbers of women and children are always in demand for preparing the fruit. The cans are packed in cases of two dozen each. Many of the canneries handle over 100,000 cases each season. For drying, the apricot is cut in halves, and placed on trays. A number of these trays are then run into the sulphur box; the door is closed, and a pan containing sulphur is placed inside the box and burned. In growing apricots one must be ever on the watch for some enemy. One of the most troublesome is the gopher. Burrowing in the ground he leaves few traces of his presence. Almost before one is aware one of the finest trees has been girdled, and a few such trees not only spoil the appearance of the orchard, but reduce the yield considerably. Another pest is the scale. No real remedy is known for this which is not severe enough to injure the tree. While apricots can be raised in many parts of California, yet owing to the diversity of the soil and climate, they can only be profitably grown in a comparatively small portion of the State.

Raising Colts for Sale.—There are altogether too many geldings on many farms. Mares are, in every respect, as good for work, and will lose hardly a month in the year producing a colt that will make something above the cost of raising it, if fairly well treated. The amount of profit from selling the colt will depend much upon the judgment and economy with which he is raised, and this does not mean in starving him, but in feeding a ration adapted to his growth. The main point, however, in making a profit out of the colt, is to put him on the market with a sleek coat on him. He must be fairly fat, and with all the loose, long hairs cut off, and the sunburn brown removed by stabling, blanketing and rubbing. A little extra rubbing before selling will put dollars into your pocket.

HOUSEHOLD

Education for Mothers.

ALICE CHITTENDEN.

There are many lovely and devoted mothers who in early life lacked the wealth and time necessary to acquire the education and culture which later in life they have been able to afford their own children. It is a painful time in a mother's life when she realizes the immensity of the gulf which, by the self-sacrifice and labor of her earlier years, she has thus placed between herself and her children. The daughter freshly graduated from Vassar, or the son in his Junior year at Yale or Harvard, will be quick to note errors in pronunciation and lapses in grammar on the part of the parents, which, unless filial love far exceed self-love, will cause them to blush.

Naturally, the question of how this state of affairs shall be remedied presents itself. It is useless to assume that a mother, with all the weight of her home cares and duties, can keep pace in the acquirement of knowledge with this daughter or son, but it is quite within the province of most mothers who can afford to give their children the benefits of a collegiate education to take so much time for self-culture as shall at least bridge the gulf. Of course, as in the acquirement of all knowledge, the first step is to realize one's own ignorance. If observation be not sufficient, or if one does not meet cultured people, there are still two ways of finding out one's mistakes. The careful perusal of even a single work of a classical writer like the elder Hawthorne, or of one or two of the best modern novels in which conversation abounds, will show you that cultured persons do not use double negatives and will almost force upon you, by contrast, ordinary and correct forms of speech. Another way is to learn from your own children. A mother, especially, should be upon such terms of close intimacy with her children that they can lovingly, and without causing her the slightest humiliation, point out to her such errors in speech as she may be in the habit of making. It is no surprising thing that a mother, after having given twenty years of the best part of her life to caring for her little ones, should find such measure of knowledge as she may have acquired in early life so entirely a thing of the past that it might almost as well never have been.

In such cases the mother's duty is a plain one. With her more leisurely life and matured mind she can soon remedy the most palpable defects. One hour a day, nay, even half an hour, given regularly and faithfully to the thoughtful reading, rather than study, of elementary text books on grammar and arithmetic will, in the course of a few months, teach all that at her time of life it is necessary to know of those branches in order to make a creditable appearance in society. In all of the sciences there are elementary text books by the perusal of which, without taking the time necessary for a thorough knowledge of each, one may at least broaden one's mind and widen one's horizon. To read "How to Know Wild Flowers," by Mrs. William Starr Dana, is a delightful recreation, especially if in connection with the reading you take the requisite walks in search of the flowers, and when you have mastered this work you will probably know more about the flora of your own locality than your girl at Vassar, or your son at Harvard. Every bit of learning on parallel lines with theirs, which you may be able to acquire, will give you an added importance in their eyes. There has never been a time in the world's history when books have been as cheap. Complete sets of histories, novels and essays, such as in your young days only wealthy persons might have in their libraries, can now be had for the most trifling sums. However much your children may get ahead of you in real, solid knowledge, you can easily keep pace with them in general reading, and there is no better culture for the mind.

It may not be amiss to hint at the duty of educated children to their less cultured parents. Never be ashamed of them. Correct, tenderly and lovingly, as far as possible, the most glaring slips of speech. Talk at home of what you are learning. Not in a pedantic manner, using the most abstruse and scientific terms you can command, but entertainingly and simply, diffusing bits of knowledge that in themselves shall form a means of culture for the dear mother whose life has been one long sacrifice of self. This for the home circle, but when guests are present, as far as possible avoid vaunting your learning and talk of such simple and general subjects that your mother can join in the conversation. Always remember to whose loving care and hard labor you owe the knowledge in which you delight, and which will fit you to move in the cultured circles of society.

The Beautiful in Farm Life.

EDGAR L. VINCENT.

There is some danger that farmers will become so intent on making their lands pay a money return that they will lose sight of much that is beautiful in country life. It is not all of life to be able to say at the end of each year that there is a good margin on the right side of the farm account. This is all right, of course; we are on the farm as a business. We ought to do our best to make it pay. But it will not do to make money the sole object of our labor. This is especially true if we have children, To bend every energy, from daylight to dark, from week's end to week's end and from one year's beginning to another, to the getting of money, is demoralizing to the farmer, to his wife and doubly so to his children. Life's beginning is a most important era. If to the young it be clouded by the gloom of a home where the only object in living is to get money, the shadow rarely lifts. The whole life will be tinged with the memory of those early days on the farm. I believe that is one great reason why so many leave the farm. Their lives in the old home were a ceaseless grind, unrelieved by anything which touched the tenderer side of nature. What, then, shall we do to remedy this? Make home as beautiful as possible. Suppose the house is old and you are not able to build another. Beautify it as much as you can. Set out trees around it, clear away weeds, tumble-down fences, and all unsightly objects. Let grass grow fresh and green all about it. Plant flowers in pleasant places. And so all over the farm. It will cost only a little time to make it beautiful. Inside make the house homelike. A few books and papers; music if you can afford it; at eventide let there be an ingathering of all the children. Read aloud to them and have them read also. Be one of them and have a share in all that interests them. Study nature with them. How many know the names and habits of the birds which flit about in summer? Who of us can tell the names of the flowers which spring up everywhere on the farm? This may seem to some farmers "all nonsense." From such a decision I most earnestly appeal. The little lives entrusted to us are the most precious of all God's gifts to us. It lies in our power to dwarf them or help them unfold and reach heights of success we ourselves may never attain. We have no right to entail upon our children the heritage which many parents do when they teach them to hate farm life. There is no place on earth which is nearer to Nature's heart than the farm. We ought to love it and teach our children to love it, too. Farm life pays if it leads him who follows it one single step higher than he was at first. No matter whether we die rich in money or not if at the last our friends can say of us that we loved Nature and Nature's God, and pointed the way up to them.

To Preserve Flowers.

The natural colors of many flowers can be preserved with greater or less success by drying them in sand. Bore holes in a shallow box and paste paper over them. Put twelve and a half pounds of fine, dry sand in a large flat pan and set it over a slow fire; over the top scrape an ounce of tallow and stir thoroughly until it has melted in the hot sand. Success depends upon the thoroughness with which this mixing is done. Pass a half-inch layer of the sand through a fine sieve into the box and stick in this the leaves and flowers, filling in the interstices with small ones; cover with another layer of sand, touching the sides of the box gently to fill the spaces. Put on the cover of the box and tie shut with a cord; keep in a warm place for three or four days. Then set the box in the cellar for half a day, take the paper from the holes in the bottom and let the sand run out. Use only single flowers with slender stems for this purpose.

Men as Household Helpers.

E. N. GEORGE.

An active farmer is not supposed to be confined to the house very much, but is generally to be found at his "office," which is the field or the stable. Still, there are many times, such as stormy days, when he has the company of his family indoors, and then there exists the chance for him to show what kind of a "family man" he is. Every good wife takes a keen interest in her husband's out-of-door work, and he should not be so thoughtless as to be indifferent to her household labors. He should remember that she has no "rainy days" of leisure, but must follow a daily routine of kitchen labor, from January to January. Consequently there is always a batch of chores on hand, either large or small, that the wife has not found time to do, and many of these little jobs the husband can neatly dispose of, on a rainy day, if he is so inclined. It is not beneath a true husband's dignity to sweep the kitchen floor, dust the furniture, or even to wipe dishes. I know of farm homes where there exists much domestic unhappiness, because husband and wife are so little acquainted with one another. They are kept socially estranged through the toil, toil, that burdens their lives. The husband never thinks that he can spare a moment of time to assist his wife, or to make her duties easier, while she daily performs many chores about the barn and outhouses that are naturally his to do. It is said that the lack of attractiveness of American farm homes more than anything else in the life itself, drives young men and women from the country to the city. I am myself acquainted with many cases where juvenile discontent is clearly attributable to this cause. How is the farm home to be made attractive?

First, the husband and wife must be made to see that a possibility exists, that their own home may not seem as pleasant to their children as do other people's homes. Then let them talk this possibility over mutually, and give it the benefit of the doubt by adding new attractions. More pictures on the walls, and more games on the table, do not always fill the want if the chiefest of all attractions is lacking, disposition on the part of father and mother to help one another. Putting down carpets, putting up window shades, and kindred work, is too hard for a woman to do, so let your wife know that you think so by pitching in and doing it yourself voluntarily. Don't look sheepish over it, as though you considered the labor beneath your dignity, but go about it with hearty zest and manliness, and that bit of household labor will always be to you a pleasant memory. If you notice that your wife is scrubbing the kitchen floor twice a week to keep it clean, because there is no carpet on it, buy a quart of stain and a pint of varnish and apply it, when there will be no more need of the scrubbing brush. You can help your wife much by making the summer kitchen warm enough for a dairy room in winter, where the milk will be removed from the odors of the winter kitchen. The addition of building paper to the unplastered walls, and the presence of a small stove to regulate the temperature, will change the summer kitchen into an excellent place for making winter butter.

When you come to get into the habit of spending your odd moments in the house, looking for chances to fix up something more handy for your wife, you will love and appreciate your home more than you ever did before. Then not only will the old farmhouse become attractive to yourself and your faithful companion, but to your children also, and you will have unconsciously created at your own fireside an ideal happy American rural home.

For Tired Eyes.

MRS. E. M. LUCAS.

In these days of study and sedentary work, requiring much use of eyes, they often become so tired that they refuse to do good work. This is particularly true when the work is done in a poor light, or when it is very fine work. Few eyes will bear such treatment for any great length of time

without being spoiled. There is one remedy for tired eyes that has great value. It consists in massage with the hand wetted in cold water. Fill a basin with water, and, standing over it, fill the hand with as much water as it will hold, and apply to the eyes; at the same time, with the thumb and forefinger give the eyes a gentle manipulation. Continue the process for four or five minutes several times a day. The results are always beneficial and almost marvelous.

MARY E. MORAN.

After the visitors had gone Kathy went back and slowly surveyed the parlor. It was not an encouraging prospect. In the bright spring sunshine the worn hair-cloth furniture, the frayed rag carpet, the cracked paper shades, the miscellaneous collection of shells and the cheap vases filled with faded paper flowers, looked hopelessly shabby and vulgar. Kathy had just come back from a happy three years at the Seminary, and she knew better now—she had not realized before, how very desolate, how forlorn and unhomelike the little room was. She picked up her hat and flew for refuge to the old crooked apple tree where she had gone with all her childish troubles in the old days, and as of old the brook sang to her its cheerful, rippling song, the apple blossoms enveloped her in a rosy cloud, and the birds chirped a glad welcome to spring and to Kathy, and somehow the load lifted. It lifted still more as, after a quick glance at the meadow in which buttercups, daisies and clover blooms were just giving a foretaste and promise of the future sweetness and bright mosaic of color which she knew she would find there later.

"Yes," said her father that night when Kathy hinted of her plan, "yes, anythin' you kin make off them weeds in the lower medder you kin keep."

"Thank you," said Kathy, as she dimpled merrily.

Next morning's mail carried a letter to a florist in the city of Marshall some 30 miles distant, and in three days the anxiously awaited reply came.

KATHY'S BOOK-CASE.

Mr. Bristow would take all the wild flowers she could send him. They were a "fad" just then with society ladies, who were giving yellow and pink luncheons, lavender and violet teas, and daisy suppers. Every morning now Kathy was up at break of day gathering wild flowers, "weeds" Mr. Stowe called them, to go to the city by the early train. The old-fashioned garden, too, was levied on; never before had it been so carefully tended, and never before had the sweet peas, the old-fashioned roses, the Sweet Williams and phloxes bloomed so royally. Every night Kathy looked at the old tobacco pouch, which was growing fatter and fatter. All through the summer she wore her old gowns and received her callers sweetly in the dreary little parlor, until one crisp October morning, Kathy instead of the flowers, took the early train to the city, and returned at night laden with parcels, of which more followed by express.

Then followed two weeks of work, more wearying and less esthetic than picking flowers laden with the dew. Mrs. Stowe was too hard worked in dairy and kitchen to help, or, indeed, hardly to notice, what was going on, and Silas went to bed as soon as the "chores" were done. But Kathy was young and hopeful, and worked with a will. Literally, she turned everything inside out, then she scrubbed floors, windows and paint, sand papered all the wood work and with the contents of certain mysterious little cans, which after all were not dynamite, she painted it with two coats of ordinary cream paint. The paper, although it cost but ten cents a roll, and was hung by Kathy herself, was very dainty with its cream ground and colonial designs in faint terra-cottas and old blues. The frieze in deep old blue, was only cartridge paper cut in two, with quaint, irregular designs done in liquid gilt. The picture rail was made of hickory withes split in two, and painted

FIG. 1. PICTURE FRAME.

cream, like the rest of the wood-work, the nail heads and knots touched up with gilt, producing a very odd and striking effect.

The mantel was the crowning triumph, for above the old shelf was a pretty over-mantel which our ingenious fairy had made from part of an old trundle bed, the spokes forming uprights and the headboard a second shelf. Two coats of white paint and a third of ivory enamel gave a surface as hard as marble. Here Kathy grouped some of grandmother's rosebud china, the brass candlesticks, and a ginger jar enameled a dull blue, and filled with feathery grasses and thistle balls; over the mantel hung a bright Japanese umbrella, and on the ceiling were grouped circles and half-circles of gay little Japanese fans which cost but a few cents each, and brighten up a plain white-washed ceiling wonderfully. Five dollars worth of tiles in old blues and golden olives made a most charming hearth, and grandmother's fire-dogs and fender polished until you could see yourself in them, completed a fireside that Kathy might well be proud of.

In the center of the floor was a rug made from the best parts of the rag carpet dyed terra cotta, and outside of this the floor was stained oak. The table was draped with a fringed terra cotta cloth which proved to be only an old shawl from the attic disguised by the same process and embroidered with fleur-de-lis, cut from old blue plush and couched on with Japanese gold thread. A yard of this plush furnished fleur-de-lis for the table cover and the portières which were only a pair of home-spun bed blankets too thin for warmth. These were left the original old cream color, and with the blue fleur-de-lis and the old blue borders of the blankets, formed most artistic curtains. On the table stood such a pretty lamp which Kathy explained was only a common, squatty lamp placed in an earthen bowl, enameled deep terra cotta and fitted with a shade of pink tissue paper and thistle pompons. Another ginger jar enameled dull blue and filled with bitter-sweet, and Kathy's work-basket, a pretty blue ribboned affair given her by a schoolmate, made a pretty spot of color.

The old paper shades were replaced with ecru holland on spring rollers, and outside of these hung scrim curtains of a cream color with polka dots in old red. They cost but ten cents a yard and the ribbons that looped them back were dyed, but Kathy was beginning to see the end of the $28

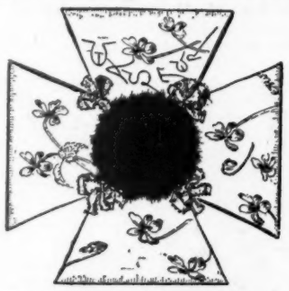


FIG. 2. KING'S DAUGHTER FRAME.

that had made the pouch so heavy. In a recess stood a book-case, two of its shelves well filled with books, more of the dear old china on a third shelf, and above it a blue delf plate and a couple of terra cotta vases, cheap as to price but artistic in shape. Across the bottom shelves hung a curtain of blue denim, behind which stood the family work basket with its load of darning and mending, but no one recognized in this book-case and china cabinet the old closet until Kathy explained that she had only removed the doors and painted it to work this transformation. The old furniture had the hair cloth ripped off, and an inexpensive furniture tapestry of linen and wool in shades of tan, terra cotta and old blue had taken its place.

Mr. Stowe no longer goes to bed the moment the "chores" are done, but reads the AMERICAN AGRICULTURIST beside the cheerful blaze of the hickory logs in the pretty fireplace, while Mrs. Stowe and Kathy mend and darn by the home-like table, the latter dreaming of next summer's flowers, when the rest of the house shall come under the spell of her fairy wand.

Pretty Easter Offerings.

ELLA S. WELCH.

"Greeting and many wishes further take,
Sent in remembrance for friendship's sake."

The "Sunday of Joy," as it was called in olden times, is recognized not only as a religious feast, but a day on which to exchange gifts of love and friendship. These should have some sentiment or appropriate message accompanying them. Many dainty and suggestive gifts can be manufactured at home. Water color paper can be used largely in the makeup of both useful and ornamental trifles. Although a little knowledge of painting enhances their beauty, it is not at all essential, as

FIG. 3. POSTAL CARD CASE.

the liquid gold and silver form a very pleasing and striking contrast with the ivory white paper, and can be applied by any one. Picture frames are always in order, and for these the water color paper is especially adapted. The frame in the form of an egg, shown in Fig. 1, is particularly pretty. It is made of two egg-shaped pieces; the upper one has an opening cut in it, and the under a slit in which to slip the photograph. The top one is decorated with gold, and the simple manner in which it is done will be found very effective. When dry, join the edges by gluing them

neatly together. The picture of an ideal child's head fitted in it gives it the form of an Easter card, which is very pleasing and pretty.

Among your friends there may be some one who will especially prize a "King's Daughter" frame (Fig. 2). To make this, take a perfect square of paper, fold down the corners until they meet in the middle, clip out the corners and cut an open ing in the center for the picture. This will give you a correct pattern. The frame can then be cut of any desired size from celluloid, ivorine or water color paper. Cut a back of the same shape and size, but without the opening in the center.

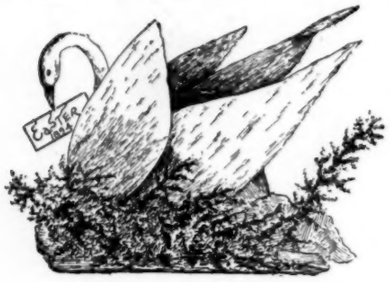


FIG. 4. EASTER DINNER FAVOR.

Lay on the picture, secure it with a drop of glue, and tie the corners together with purple ribbon. It may appropriately be placed on a small silvered easel, which will daintily support it.

The case for postal cards, shown in Fig. 3, not only takes the form of an Easter card, but will be found very useful to suspend in the guest chamber, as a postal is about the first article one needs at the end of a journey. Cut two pieces of the paper the desired size in the shape of a heart; roll the upper left hand side of one over and tie it down with a bow of light green ribbon; then overcast the two parts together with green silk, and do the lettering and little leaves with gold. Attach a little green enameled pencil on a narrow green ribbon.

A pretty Easter dinner favor can be made from crepe tissue paper. For the foundation cut an oval piece of pasteboard three and one-half by five inches; ruffle up half a sheet of plain white tissue paper and fold it around a small glass tumbler; tie it together, leaving the ends to project about two inches. Crush the paper now in front and draw it up on the sides; remove the glass and glue a swan on the foundation. Cut a wings from the crepe tissue paper, and also a strip for the neck; this is made over a piece of wire, first covered with cotton, then with the paper. Wind one end with yellow silk, to imitate the beak; make the eyes with black ink, bend the neck and glue it in, then glue the wings on. Cover the foundation with green artificial moss, which can be

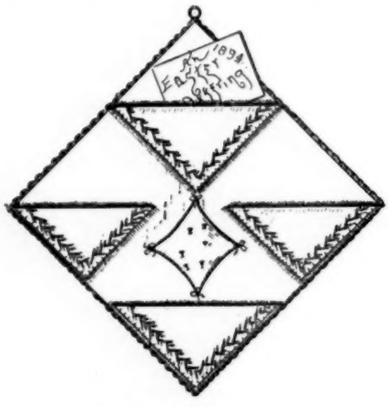


FIG. 5. TOILET BOARD.

purchased in small packages. Set the tumbler in to hold the flowers, as seen in Fig. 4. This can be made large enough for a center piece on the dinner table.

A toilet board (Fig. 5) is one of the few things that can be packed without marring its appearance, and it is therefore suitable for a friend who is boarding or for one about to take a journey. It is used to hold a watch and other pieces of jewelry, hairpins, comb, scissors, and manicure appointments. A thin square of wood is covered with white linen drawn smoothly over the upper side and tacked down on the back. The pockets are formed of square pieces of linen buttonholed and briar-stitched with silk, the lower corners with the edge turned under and tacked down, the upper allowed to fall over and fringed. Between the pockets a square, flat cushion is tacked down.

The hair-pin tray shown in Fig. 6 is also nice for a traveling friend, as it can be flattened out and laced up at a moment's notice. To make one, take two triangular pieces of white linen measuring seven and a half inches on each side. Notches are cut out the corners three-quarters of an inch deep; the top piece has a spray of maiden hair fern, a few scattered hair pins, and the feather stitching done in wash silk. The two pieces are joined with a buttonhole stitch edge. The edges are turned in on the corners and little eyelet holes worked in them to lace it up. It is then laundered very stiff and smooth, the sides bent up as here indicated, and tied together with green silk cord.

A model for a cunning little stamp box (Fig. 7) is made of the heaviest water color board, cut after the following measurements: The bottom two and three-fourths by one and three-fourths, the ends cut slanting; the lid is cut a trifle larger. The front three-fourths by two and three-fourths. The ends one and three-fourths by three-fourths on one side, and one and one-half on the other. Back, two and three-fourths by one and one-half. These are all neatly joined with glue. Little cleats of the board are glued on the under side of the lid, to hold it on. The lid is painted to imitate an envelope. The word "Stamps" on the front designates its use.

A pleasing card for a child can be manufactured

FIG. 6. HAIR PIN TRAY.

at home on a short notice, with the aid of half a dozen apple seeds. These are transformed into little mice and mounted on a piece of card board, surrounded by the little ditty,

"Six little mice on their way
To carry my love to you to-day."

done in fancy gilt lettering. The card is also bordered with gilt and suspended by a bit of gold-colored ribbon, as seen in Fig. 8.

Ounces of Prevention.

LOUISE PROSSER BATES.

Recent scientific investigations have demonstrated the fact that, weight for weight, water often contains more germs in winter than in summer. This is easily accounted for when one remembers that in summer brooks and rivers are flushed by the deluging rains, and the surface is washed clean by the same means. In winter, however, the surface water, from melting snow or from frozen ground, contains, necessarily, a larger amount of bacteria than underground spring water. Freezing does not, as is ordinarily supposed, kill out all this vegetable life. It is very important, then, in winter, to see that uncovered springs are kept pure, and that there is no possibility of contaminating those inclosed by a curb. Germ filters add to, rather than decrease the difficulty, unless they are very large and are frequently cleaned.

In preparing milk for children who are to be carried on long journeys, it should be kept just below the boiling point half an hour for three days in succession. As soon as the milking is done the milk should be placed in bottles holding just enough for one meal, or in two or three larger bottles, placed in a dish of boiling water, with a rack or some arrangement to keep them off the bottom and hold them upright. They may be corked, if one desires, with a perforated cork. The first day's heating kills the bacteria, but does not kill the seeds or spores. These require twenty-four or thirty-six hours to develop. The second heating kills the newly developed germs, and the third those that are left. By keeping the bottles air tight, milk treated in this way may be kept sweet and pure for several days at least.

The practice of doing up wounds in cobwebs to stop the bleeding, is one that ought never to be imitated. It has been found that the germs of

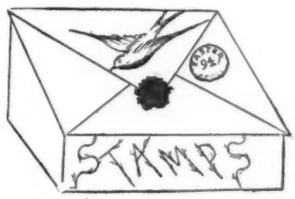


FIG. 7. POSTAGE STAMP BOX.

pus, and even those of the deadly tetanus, or lock-jaw, frequently lurk in these cobwebs, and it is simply risking a person's life to use such wrappings. Some antiseptic preparation, with perfect cleanliness, is the only safe treatment for a bruise or cut.

All articles used about a scarlet fever or diphtheria patient, especially bedding and blankets, should be thoroughly disinfected, and if possible by heat. Some of the most malignant cases of these diseases have been traced directly to bed clothing that had been given away, or had been stored for months or years after a fatal illness. These germs, unlike those of whooping cough and measles, retain their vitality for a long time, and are actively poisonous.

Just Simply Clean.

NELLIE BURNS.

As I sat in a public assemblage recently, my attention was attracted to a couple of youths, aged about sixteen and eighteen years, who sat directly in front of me. By their strong resemblance I knew they were brothers. I could not understand, at first, what it was about them that fascinated my gaze. Their gentlemanly deportment was one thing, to be sure, but they seemed to possess some charm which I could not at first analyze. Finally I found that their great attraction was nothing more than an exquisite cleanliness of person and dress. Their heads, hair, faces, necks, ears, hands and finger-nails were faultlessly clean and fresh looking. Their cuffs and collars were laundered to perfection. Their clothing was not of fine material, but it was clean and fresh looking, and not a speck of dust was to be seen on it.

While admiring them a girl of about the same age came in and took a seat near one. Her dress throughout was of fine material, but the folds of her waist had proven receptacles for dust and dandruff; specks of dandruff flecked her hair;

FIG. 8. CHILD'S CARD.

there was a rent more than an inch long in the arm-hole of her dress; the fine lace that adorned her neck was soiled from contact with her unclean hair; one ungloved hand revealed finger-nails in deep mourning, and the kid glove which covered the other hand had several rips in it. Altogether her appearance was decidedly slovenly, notwithstanding the fact that she wore rich material throughout. The contrasting appearance of these young people was highly suggestive of a little sermon.

Many young folks think if they can only dress in the latest style and make a showy appearance that the little details of the toilet do not matter.

But no amount of silks and velvets, or the latest cut of fashion, can redeem uncleanness and untidiness in the person. Unclean hands and fingernails, grimy necks and ears, are unpardonable. And yet it is surprising how many large boys and girls are guilty of such personal neglect. It is a common thing, too, to see girls with buttons missing from dresses and shoes, or with their hair adorned with soiled and wrinkled ribbons. Quite recently, while on the street, a young miss just in front of me revealed at every step her bare heel which her low walking shoes exposed through a hole in her stocking.

It is not the fashionable cut of one's garment or the fineness of the material that makes the well-dressed person. The combined details of the toilet determine that point more than the general dress. The skin should be fastidiously clean; laces and collars that environ the neck should not be worn until they are soiled; the pocket handkerchief should be well ironed and snowy; every button should be in place on shoe and garment; gloves free from rips; shoes brightly polished, and clothing free from dust and rents. It is these things that go a great way toward making the well dressed person. To be simply clean is a long step toward a faultlessness of appearance.

Improving a Closet.

Very few closets are arranged so as to afford the greatest convenience for the space that is at hand. The bottoms of the dark ends become confused heaps of odds and ends, occupying a good deal of space to but little purpose. The illustration shows how to utilize most perfectly an end of a closet. A set of drawers occupies the longer half of the space, with shelves above. The other end

IMPROVED CLOSET.

can be treated in the same way, if desired; but a better way, perhaps, would be to leave the end clear for the hanging up of clothing, with a box the width of the closet, having a hinged cover, to occupy the floor space below, in which boots, rubbers and other articles may be placed.

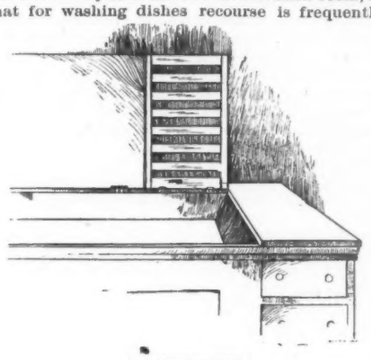
Homemade Picture Frames.

PRUDENCE RHODES.

In no respect has the artistic wave that has struck the country made itself more deeply felt than in the framing of pictures. It is now generally conceded that a frame must needs be only a simple, but appropriate one, and that anything which, by its elegance draws attention from the picture itself, is in bad taste. This has given rise to many ingenious attempts at home framing, many of which have proved very satisfactory. One of the most pleasing of these had no other element in its construction than some stout pasteboard, cut from an old box, some heavy twine, and a bottle of liquid gilt. The picture was a pleasing and well-executed landscape in pastel. Four strips of pasteboard, two inches wide, were cut, mitered at the corners, and firmly glued together; the space thus inclosed was half an inch smaller than the picture each way. Next, parallel rows of heavy twine were securely sewed to the pasteboard, which was then tacked to four thin strips of board, and the whole outside surface gilded a dull old gold. On the outside of the thin strips of board, a tiny molding—any bits of thin sticks will do—was tacked all around on the back, to receive the glass and picture, which was then covered with a thin board back, and pasted over with stout brown paper. Saving the heavy twine that comes around packages will make even the purchase of a ball of twine unnecessary. A frame of this sort, enameled white and picked out with dull gold, would be a very appropriate frame for a pastel, or colored sketch of any kind. Of stained oak, cherry, or mahogany, it would make pleasing frame for an etching.

Improving a Kitchen Sink.

The ordinary sink has insufficient shelf room, so that for washing dishes recourse is frequently



A HANDY SINK.

had to a table moved up to one end, on which to place dishes when they are washed. The illustration shows two separate covers hinged to the farther side of the sink, which may be let down to rest upon its front edge, the part with slats forming a dish drainer that will be appreciated every time the dishes are washed, and the other forming a solid cover which virtually converts the sink into a table when there is need of more table room. Any one at all handy with tools should be able to attach these conveniences to the kitchen sink at small expense of money, time or labor.

Autograph Sofa Pillow.

Autograph sofa pillows are the latest fad. Our sketch illustrates one given by a fashionable club to one of its departing members. The materials are dark red and cream white India silk. The light half is embroidered with a bunch of daisies; the dark half forms a foundation for the cards of cream white linen, with the autographs outlined on with filoselle, and the card then overhanded with red silk. A double frill of red silk surrounds the pillow. A washable one may be made of

A NOVEL AUTOGRAPH COLLECTION.

white linen and duck, with the autographs outlined on with wash silk.

A Novel Doll Party.

PALMETTA MONTCLAIR.

This was not, as its name suggests, a little girl's party for her dolls, but a real grown-up affair where the youths and maidens assumed, for the time being, the personality of some doll of high or low degree. It was a most amusing and unique party. If young people find themselves at a loss for amusement they can hardly do better than to put their heads together and evolve something of the kind. Its success will depend entirely upon the ingenuity of the participants, but a visit to the doll department of any large toy store will be of great assistance. A little practice of the actor's art in "making up" will also be very useful.

It is perhaps easier to be the "understudy" of a Japanese doll than of most other kinds. You must of course have a mask face, on which make slanting eyebrows with burnt cork, painting the lips of deepest carmine. Simulate the little bald pate with a circle of flesh-pink cotton cloth, to which is sewed a fringe of black silk or worsted. There is a child's paper picture book called "Jappie-Chappie" that will give an excellent idea of the costume necessary, but nothing is easier than to make the straight, flowing-sleeved "kimono." There are rubber dolls for the costuming of which any amount of old grey underwear will come in. You may be a talking doll and say, as the Edison doll, "Give brother big piece, give me little piece," when you have been properly wound up, or you may limit yourself to the language of that other monstrosity—the doll who says "Mamma," and "Papa."

The favorite costume, because so easily devised, is that of the rag doll. But whatever the character assumed, be sure to let the actions correspond. Paper dolls, with chalked, expressionless faces, standing in a row, dressed in ecru muslin, as if cut from manila paper, or in white, as if cut from white paper, will create much amusement. Of course the masquerade may be dropped at any time during the evening, possibly the earlier the better, bearing in mind the fact that there can be too much of even a good thing.

Pretty Silk Edging.

A pretty and effective way to trim the garments of little folks, and one requiring very little work, is

EASILY MADE BORDER.

that shown in the accompanying sketch. It is simply a double buttonhole stitch worked at regular intervals in which a shell of the silk is afterwards crocheted in. It can be used to border sacks, shawls, gowns and the yokes, collars and cuffs of the dainty dresses.

Hot Cross Buns.

MAY SILVERS.

In an old work called "The Book of Days, a Miscellany of Popular Antiquities," I find some curious facts, or theories, rather, regarding the familiar "hot cross bun." In ancient Egypt, cakes, horned to resemble the sacred heifer, were offered in worship to the Queen of Heaven. These were called "*bous*," which has "*bons*" in one of its oblique cases, hence "*bun*." In Rome, in the Museo Borbonico, there is a piece of ancient sculpture representing the miracle of the five barley loaves, the loaves being marked with a cross.

Early in the present century in England, people came from considerable distances to taste the delights of the famous hot cross buns of the Chelsea Bun House, and there were also rival bun-houses, one called "The Real Old Original Chelsea Bun-House." There was also a "Royal Bun-House," implying that the king had favored it with his patronage. Indeed, at the present day, all over London, on the morning of Good Friday, one is greeted with a universal cry of "Hot Cross Buns," which custom will go down to untold generations as sung in the Mother Goose melody:

"One a penny, two a penny,
Hot Cross Buns;
If your daughters don't like them
Give them to your sons."

An early, and in some parts of England a still prevalent superstition, connected with bread baked on Good Friday, is that a quantity of it grated in water is a specific for any ailment. Certain it is that our pagan ancestors, the Saxons, and, indeed, the German race, in a general way, ate consecrated cakes at this season in honor of their goddess Eostre. The Christian clergy, unable to abolish the custom, endeavored to expel the paganism by stamping the cakes with a cross.

For those who do not care to trust the making of this old-time delicacy to the baker's art, I give some tested and excellent recipes that may be relied on if followed exactly, to give satisfaction. Rub four ounces of butter into two pounds of flour; add half a teaspoonful of salt, a wineglass (a gill) of fresh, thick yeast, or a compressed yeast cake, with one and a half pints of warmed milk; mix these ingredients to a smooth batter and set away in a warm place until well risen. Then work in half a pound each of sugar and well-washed, dried and floured currants, half a grated nutmeg and as much powdered mace. Knead well, make into buns and set to rise on buttered baking tins; make a cross on top with the back of a knife, brush over with melted butter, and when light bake in a good oven, and the result will be very satisfactory. Baker's buns are colored with saffron.

If you will mark the buns made from the following recipe with a cross they more nearly approach one's conception of what hot cross buns ought to be than those made from a plainer recipe. Boil a pint of milk, and while still hot melt in it a cup of butter; when it cools to blood heat stir in half of a compressed yeast cake dissolved in half a cup of luke-warm water and one quart and a pint of sifted flour. Beat well, cover and stand in a room at at about 70° until morning. Beat together half a cup of sugar and the yolks of six eggs; add these, with a teaspoonful of cinnamon to the sponge; now work in half a cup of washed, dried and floured currants, and next a half cup of shreded citron, also floured; work until thoroughly mixed, then add flour until you can roll out on a board; cut out with a round cake cutter; put in greased pans; mark on a cross with the back of a knife and set in a warm place until very light. Bake for thirty-minutes in a good oven.

One Woman's Kitchen.

The accompanying illustration shows how one woman had a portion of her kitchen remodeled to secure greater convenience in housekeeping. The sketch shows one whole end, and quite fully explains itself. The top of the central cabinet forms a huge kneading board and has a cover with fitted sides and ends to let down over this kneading board top being hinged at the rear. Under this top is a broad drawer in which are kept the rolling pin, cake, doughnut and biscuit cutters, and various other small articles of a like nature. Below is a closet in which are kept the molasses jug, vinegar jug and lard pail, and here also may be kept iron dishes. Upon either side are closets arranged to roll in barrels of flour, two or more kinds, with a chance also for a barrel of whole wheat flour and a barrel of sugar. The tops of these closets are hinged to give access to the barrels. The shelves arranged upon either side, which may have glass or wooden doors if desired, contain the kitchen crockery and tinware, while the drawers

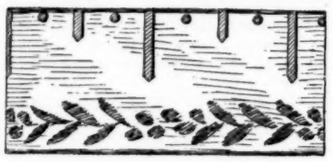
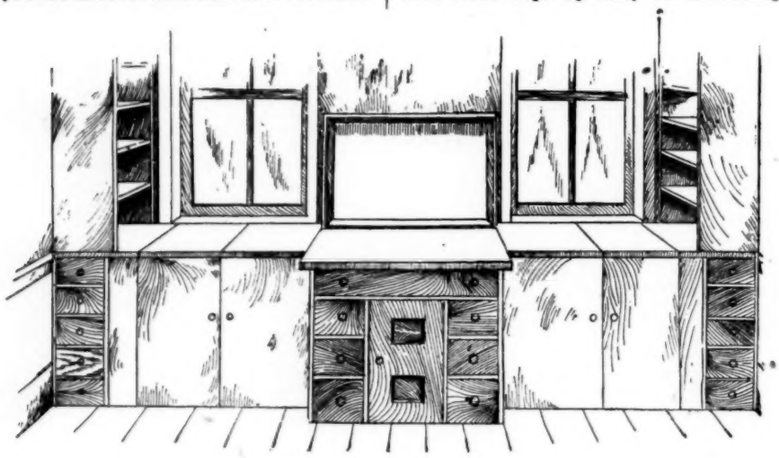


FIG. 1. PATTERN OF YARD MEASURE.

below and in the central cabinet afford accommodation for the dozens of articles that go to aid in kitchen work. Two windows are quite essential in such an arrangement as this, unless there are near-by side windows to afford plenty of light at the kneading table. Such an arrangement saves hundreds of steps by bringing all the materials of cooking into one spot, and by so much lightens the labor of the housekeeper.



CONVENIENT KITCHEN ARRANGEMENT.

A Ribbon Yard Measure.

A ribbon measure, to take the place of a tape measure, is a pretty addition to the fittings of a work basket kept especially for the making of fancy articles. For a yard measure choose heavy stiff gros grain ribbon an inch and a quarter wide; thirty-eight and one-half inches will be needed; fold over a quarter of an inch at each end, then fold over exactly one inch more, for the hems. The measure will then be thirty-six inches long.

FIG. 2. RIBBON MEASURE.

With a pencil mark the inches with half-inch lines, the half-inch with quarter-inch lines, and the quarter-inches with dots; then paint them or work them accurately with fine silk. Along the other edge paint or embroider a delicate vine or work a row of fancy stitches with shaded silk. Our sketch, Fig. 1, shows one end of a measure, full size, and Fig. 2, the complete measure a yard long.

An Artistic Summer House.

It pays, even in dollars and cents, to make one's home attractive, but it also pays much better in the increased comfort and enjoyment that is afforded every member of the family when the home is attractive. An attractiveness, it may be said, that can be secured at small expense, if one has a little taste, and will devote some of his extra moments to the work of beautifying his home and its surroundings. Directly in this line is the construction of such a summer house as is shown in the illustration. Such a house will make a magnificent play room for the children, a cool summer sewing room for the mother, and a place to rest or read for any member of the family. It is built in the form of an octagon, and has a dishing, shingled

ATTRACTIVE SUMMER HOUSE.

roof, and matched siding where the sides are boarded. If vines are made to grow over the sides the beauty of the structure as an ornament to one's grounds will be greatly enhanced. The whole building should be stained to secure the best effect, the roof being of a darker color than the sides, and of a color to contrast harmoniously with them. Such a building could have window sashes fitted to it, and covers made to put over its lattice work, when it would serve as a pleasant play room for children on sunny winter days.

An Invalid's Stand.

CLARA SENSIBAUGH EVERTS.

If those who are unfortunately confined closely to the house, bed, couch or chair are given pleasant amusement and light work to occupy their minds and prevent them from dwelling on their ailments, it will materially aid in their recovery. But sensitive invalids spend many weary hours, disliking to ask for light work or a book, knowing that in a few moments it must be replaced, and rather than trouble some one to wait on them, they do without, heroically trying to hide their weariness.

The stand will be a source of untold pleasure to any invalid, and will also save much time and many steps for the well ones of the family. If made by some handy member of the family it need not cost over fifty cents, even if all the material is purchased purposely for it.

Procure a box about twenty-seven inches long, fifteen inches wide and eighteen inches deep. Stand it on one end, and on the bottom put two heavy strips to hold casters, placing one caster at each corner so that it may be rolled about the room. Six or eight inches from the bottom put in a shelf the width of the box, to hold unfinished bundles of work; under this shelf put a drawer divided into compartments for holding knitting needles, crochet hooks, silks, zephyrs and similar articles. Above this put a shelf six inches wide to hold cups and bottles if the invalid must look after her own medicines. The next shelf may hold books, magazines or games. A strip of molding should be nailed to the front of these two shelves to keep things from jarring when the stand is rolled across the floor of the room.

FIG. 1. INTERIOR ARRANGEMENT OF STAND. FIG. 2. STAND COMPLETED.

The whole interior should be covered with plain tinted wall paper. After this is done a few screw hooks should be put on the inside near the top; also a quarter-inch strip of wood about eight inches long should be tacked to one side, and three

inches above it a strip of elastic webbing, putting in a tack at intervals of two inches, and thus making places to insert pen, pencil, ruler, knife and scissors. Also tack on pockets for holding paper, envelopes and postals, and add a pincushion and needlebook, hanging them up inside. Provide a piece of tin or very thin board about eighteen by twelve inches; cover this smoothly on both sides with some soft material to use as a writing pad. A strip of elastic tacked across the top to slip the writing under and hold it in position, will be an improvement. The tin is firm, smooth and so light that it cannot tire the weakest to hold it.

Paint or paper the outside of the box and cover the top with a pretty scarf or fancy towel. Put up little brass brackets to hold a rod on either side at the top of the box, and shirr a curtain on a brass rod to hang in front. A lamp, a vase of flowers, a book or two, and such trifles can be placed on top, and if it is not altogether a thing of beauty it will be a joy forever where there is an invalid in the house. [Fig. 1 shows the interior of the stand, and in Fig. 2 is seen the complete stand with curtain in front.]

Spring Fashions.

It is somewhat curious to observe how names connected with France's Reign of Terror have come into vogue just one century after that sad period. Directoire and Empire gowns were much heard of last year, and now we have huge bows to adorn our house dresses that are known as *l'Incroyable* and *Robespierre* bows. There is nothing somber about these, however. They are the very gayest of the gay, fashioned of turquoise, cerise, yellow, stem-green and mauve satin ribbon from eight to ten inches in width. But there is no denying that they are stiff as they are stylish, consisting of two loops, tightly strapped, which stand out horizontally beneath the chin, minus all hanging ends, and attached to a stock collar of the same ribbon.

Another bow or scarf, designed for street wear, however, is called the *Sans-Gêne*. This is either of broad ribbon or of bias moiré silk, being particularly liked in black, the ends trimmed with écru lace. It encircles the neck, and is tied under the chin in two large drooping loops falling low on the bust. The *Sans-Gêne* bow is intended to be worn beneath a cloak and shown only when the wrap is thrown open, but here is occasionally seen outside of a coat, and will likely be popular with spring suits, when heavy garments are discarded. Other pretty *confections* for the neck are the stock collars of velvet, satin or moiré, to which is added a bib of lace. Mechlin, Venetian, guipure and the finer qualities of *Point de Gene* are greatly fancied for these bibs, with a preference for écru tints, and three-eighths of a yard is sufficient for a "fall." Dressy stock collars are likewise displayed of pink or blue crinkled gauze and of silk muslin, closing in front under a butterfly bow of lace. To brighten a dark costume a folded belt matching the collar is also employed. Black gowns are considered chic, relieved by a deep collar and cuffs of white lace, or else a yoke of heavy guipure is applied, cut square to the armholes and finished by a berthe or epaulettes of lace or of the dress material.

That overskirts are on the increase, there is no doubt. Sometimes they figure as small peplums, little more than coat skirts, attached to the belt of a round bodice, but closing in the back where they are laid in stiff godet folds; while sometimes they almost reach to the feet and are raised in places to reveal an underskirt of contrasting fabric. It is advised, too, in remodeling last year's gowns of wool to use the old skirt as an overdress above a sham skirt of silk or velvet; curving it almost to the knees at the sides and allowing it to droop low in the front and back.

The fashionable circular effect is now given to even the little two-inch frills which edge the wrists of gigot sleeves. Each tiny ruffle is made of a seven-inch square of the dress goods by rounding off the corners and cutting a hole in the center for the hand to pass through, and is lined with the color and material that trims the gown. The outer edges are run together, then turned and sewed on the outside, when the frill is put on the sleeve with two rows of stitching and stands up about the hand.

It is reported that brown will be the leading color the coming season, and runs the gamut of all the shades, from palest beige to darkest *trappiste*, or monk brown. Trim tailor-made gowns of this serviceable hue are fashioned with a long coat, severely plain to the waist line, but very full below to the knee, and with a skirt escaping the ground and standing out in godet pleats. More fanciful coats of brown hop sacking, however, are laid back in broad *revers* caught by huge buttons, while inside appears a vest of black passementerie or heavy lace laid over pale green, blue or mauve satin, with a standing collar to match; while the same tint of the waistcoat is seen in the lining of the skirt.

The big pale Parma violets in milliners' windows bespeak the approach of spring; are already replacing the feathers on many turbans of velvet and fur; and the first importations of spring millinery show these favorite flowers clustered in wee rosette-like bouquets on the front and sides of bonnets, while a stylish, green velvet bow of strapped loops appears at the back held by Rhinestone pins. It is predicted that all hats and bonnets are to be larger, but the Amazon, which promises to be the popular walking hat of the season, is not extreme, its really wide sides being turned up against the crown. A few felt "Amazons" have been worn through the winter, laden with ostrich tips and smart with big buckles, but the new ones are of écru straw, faced with black velvet or satin. They are quite picturesque. Jet bonnets draped with black tulle are light and airy, as well as becoming, but a crown of cerise velvet is fully as modish and will be a comfortable addition with which to confront the keen, la grippe-laden March winds. The glittering jet brims are so dressy that a wide bow of black velvet set high at the back and held by gold or jet pins is the only garniture required.

A Shelf for Repairs.

ELLA F. MOSBY.

There are few things of greater use to a housekeeper who has to study economy than a shelf with materials for repairing and renovating. First of all she should have two or three small cans of paint and two good brushes of different sizes. Paint preserves as well as decorates.

By far the most satisfactory method of keeping a hearth clean is to keep it painted once a week, or once a fortnight, or even once a month, according to the way it is used—it will be needful to retouch it. If you use black or the dull Pompeian red it makes a beautiful background, or rather framework for the fire, throwing into fine relief the shining brass and the fire glow until the whole hearth is like a visible welcome to guest and friend. Besides the beauty of it, it is invaluable in lessening the burden of daily labor.

In papering a room be careful to keep remnants to repair cracked or torn places. It is never easy to match. When you are upholstering furniture, it is better to use pieces of a yard or so in making cushions. These always give a room an air of comfort and completeness. It is not wise to store up remnants, for which any one can find immediate use. House room is usually worth more than an accumulation of useless odds and ends.

A little can of white paint and a bottle of liquid gilt will change the old, battered wooden picture frames into neat, pretty ones in white and gold, which are particularly pretty for bedrooms and sitting rooms, where everything should be bright and cheerful. The liquid gilt is invaluable in another kind of repairing. A friend of mine had a large and costly Japanese vase broken by accident. It could be mended with cement or glue, and she did this with the greatest care, but there were the ugly lines where the fracture had been. An inspiration of genius seized her; her smallest brush dipped in the liquid gilt was drawn along each crack, and not only hid the line of cement, but enriched the quaint, zigzag Japanese pattern, with which the fine lines of gold happily blended. It would be almost impossible to detect any breakage from the outside of the vase. There are different ways in which you can yourself make a cement for broken china; the white of an egg and flour made into a paste, or half an ounce of gum arabic dissolved in a wine glass of boiling water and thickened with plaster of paris.

Gilt may be nicely cleaned by using a mixture of alum, one ounce; niter, two ounces; salt, one ounce, all dissolved in a gill of water. For furniture use turpentine and sweet oil, and rub vigorously. There is nothing like dry rubbing with flannel for keeping the beauty and polish of wood. After all it is only half the chapter to acquire beautiful things; by far the most important part is keeping them beautiful.

Dishes for Lent.

Cream Tomato Soup.—Boil one quart of water with a can of tomatoes, two large potatoes minced fine, two onions also minced, a teaspoonful of sugar, and a few sprigs of parsley. When the potatoes are done, finish the seasoning to taste, and add at once a quart of boiling milk.

Potato Soup.—A somewhat novel potato soup is made by boiling a quart bowl of sliced potatoes with two onions sliced and fried yellow in a little butter, two stalks of celery, some parsley, a gill of canned tomatoes and a quart and a pint of water. When the potatoes are done add a tablespoonful of flour wet with water, and press through a sieve. Return to the saucepan, add butter the size of a walnut, and half a pint of hot milk or cream; season to taste, and serve with thin wafers or brown bread and butter. Another way is to boil ten medium-sized potatoes cut in halves in salted boiling water until done, drain and set aside. Put a gill of water, and butter the size of an egg into a saucepan, add a quart of milk, and when it boils the potatoes should be broken into bits, but not mashed. Season to taste and send to table at once.

Macaroni and Fish.—Lay any boiled fish, except salmon, on a bed of macaroni boiled in milk until done, but it must not be allowed to break and burst; cover with a sauce made by heating a pint of milk with two ounces of butter. Thicken this with flour wet with water to the consistency of cream; when it reaches the boiling point add the beaten yolk of an egg and one gill of tomato sauce previously made hot. Stir all the time while adding.

Anchovy Toast.—This very epicurean supper dish must be served very hot with plenty of cayenne or paprika and lemon juice to taste. Toast some neat discs of bread cut with a pastry cutter to a size a trifle larger than a silver dollar, butter and spread with anchovy paste. Lay on each a slice of hard boiled egg, and sprinkle with a little parsley minced almost as fine as dust.

Baked Eggs.—Beat the whites of six eggs to a froth, preserving the yolks intact and keeping each in a separate saucer; pour the whites into a butter dish and drop on six spoonfuls of cream and in each hollow formed by this lay a yolk; salt slightly and bake until set.

Coffee Jelly.—Soak a box of Cooper's gelatine for half an hour in a pint of cold water; add three pints of very strong, boiling Java coffee and twelve tablespoonfuls of granulated sugar. Strain through a jelly bag and put in a pretty mold to cool. When firm turn out on a dish that can be sent to the table, put kisses made with meringue or maccaroons over it and pour whipped cream over all.

Sally Lunn.—Twelve hours before it is to be eaten set a sponge with one large Irish potato boiled and mashed, three tablespoonfuls of good yeast (one compressed yeast cake), one tablespoonful of sugar and flour to make a soft batter. In three hours this should be light, when add one quart of sifted flour through which has been rubbed a cup of mixed butter and lard, four eggs well beaten and one cup of milk. The batter should be so stiff as to scarcely drop from a spoon. Beat long and hard. Five hours later beat again. Let it rise again until very light and bake in a two-quart cake tin for supper.

Maryland Biscuit.—It is hardly fair to offer this recipe to any housewife who cannot avail herself of Chinese cheap labor. The true Maryland biscuit of the South are seldom met with even in that locality since the slaves were set free. Their delicacy depends upon the faithfulness with which they are beaten. Mix an even tablespoonful of lard, half as much butter, and a teaspoonful of salt in a quart of flour; by degrees, pour in nearly half a pint of milk, working well with the hands. Lay the dough on a board and beat for half an hour. Mold into small balls, flatten with a rolling pin, prick with a fork and bake in a hot oven.

Rice and Tomatoes.—Fry two minced onions in a tablespoonful of butter until turning rather yellow; turn in a pint of tomatoes and stew fifteen minutes, seasoning as for the table. Butter a baking dish, pour in the tomatoes and two cups of boiled rice, cold or hot; mix with a fork, dot with bits of butter and bake one hour; covered for half that time, then uncover and allow them to brown.

BOYS & GIRLS.

Lize.

PHILIP MARSTON BRASHER.

"I'm goin' to kill that critter this very night!" Lize herself spoke these words in a voice trembling with anger. She stood in the chicken corral, looking at a heap of feathers which gave mute but unmistakable evidence that some sly prowler had found a supper there.

"Hello!" said Lize's father, looking over the brush fence; "Who are you going a-gunning for now?"

"The coyote that killed 'Freckles' last night. The mean thief had to pick out my pet—" but the girl's quivering lips would utter no more, and hastily gathering a handful of feathers, she held them out toward her father.

"Well, that's too bad," was the sympathetic comment; "but don't cry, Lize, and we'll fix Mr. Coyote to-night. He'll come back after another, and we'll be ready for him."

"I'm not goin' to cry;" but it took a firm setting together of the teeth and clenching of the fists to make this statement quite true. "That woudn't do any good. I'm goin' to watch out and drop that brute myself. Mayn't I, Pa? Mayn't I shoot him with my new rifle?"

"O, yes, if you want to; but I guess you'd better let Sam do it; or put out poisoned meat for the old fellow. He might carry you off if you went after him alone."

Lize knew this was only a bit of humor on her father's part. Personally she had no fear of coyotes, and when evening came the plucky girl hid herself under the brush fence, at a point commanding a view of the entire corral. It was a moonlight night, and Lize's new rifle—of which she was as proud as a city girl might be of a new piano—glistened in her lap. In vain had her mother urged that Sam be allowed to avenge poor Freckles; in vain had Sam himself insisted upon being allowed to make one of the night watch, in case of accidents.

"No," Lize had replied to all arguments and entreaties; "I want to be all alone. Freckles was all mine, and nobody shall kill that mean old coyote but me. If you went along, Sam, you'd want the fun of shootin' him. If I want help, I'll holler."

One chicken supper just whetted that "mean old coyote's" fancy for more of the same kind. He could scarcely wait till dark before starting for the corral, and on reaching it the craving of his fastidious appetite induced him to leap in without any of the reconnoitering which, in a less greedy mood, he would have considered necessary to safety. Lize heard a light footfall outside, a scramble in the brush directly over her head, and then saw a large gray body drop in front of her so close that she could almost have poked it with her rifle barrel. The coyote had accidentally scaled the fence exactly where his intending slayer lay in wait. To have made so clumsy a mistake covered the scamp with confusion as soon as he saw what a trap he was in, but regrets came too late. Lize rose to the occasion and her feet simultaneously, a sharp report followed, and Freckles was avenged.

"Tell you what it is, though," said the young huntress, modestly, afterwards, "I did get a little rattled when he jumped the fence almost into my lap; but I guess he was mighty near as much rattled as I was."

Lize was only thirteen years old at this time. As the days rolled on, she grew stronger, more active, more useful; and the fame of her frontier accomplishments spread throughout the wild region where her home was, and where she was regarded universally with respect and admiration.

"She's a screamer," said her father, with the earnestness of conviction.

"That's what she is," concurred Sam, with pride in his voice; "an' she's worth any two men in the valley, when it comes to ridin' the range."

"Yes," said the mother, a quiet little body, "I suppose she is a 'screamer,' as you say; but I wish she wouldn't ride so recklessly."

The poor little woman had never felt at ease amidst the excitements of life in the Southwest, and often sighed for the more tranquil atmosphere of her old New England home.

"Pshaw! mother," broke in the husband, with good-natured raillery. "Lize's way is just right for this country. Maybe she wouldn't drag a long silk train around a Boston drawing room quite as gracefully as the girls there can, but do you think one of those girls with long-tailed gowns on could cut a cow of the herd, or rope a steer, or drive a nail with a bullet as Lize can do it? Well, I guess not." Sam fairly shouted at the idea.

"An' Lize is prettier 'n any Boston girl alive," he said. Absolute unfamiliarity with the Boston girls' standard of beauty made this statement of Sam's a bold one.

"Why," he went on, when she hangs that ugly, old man's hat of hers on the fence, and goes cuttin' 'round bareheaded, the sunlight makes her hair sparkle till wire gold 'd be homely alongside it; and Joe Ferris, down to the X C ranch, says she is way ahead of any city girl he ever saw for pretty, an' Joe growed up in New York."

The family dwelling stood close by the river, but on a bluff high enough, it was supposed, to protect it from the freshet which occurred every spring. Early in 1884 (when Lize was sixteen), however, it became evident that a flood of unusual volume was sure to come. Snow lay very deep in the mountains where the river had its source, and frequent rains, combined with warm weather, sent it southward in floods of water that boded no good to dwellers on low lands in the valley. Some of the settlers forsook their houses and sought shelter among the foothills. "I think the house is safe enough," said Lize's father. "It is well above the highest water we've ever had yet, and it doesn't seem to me as if the river could reach us."

"But hadn't we better go and camp in the foothills for awhile?" interposed his wife. "If we wait any longer maybe we won't be able to get away at all."

"We'd have to go in the boat now," said Lize, "for there's already a pretty big river between us and the foothills."

"The lowest land 'most everywhere is under water," added Sam—for the entire family had assembled to discuss the situation, "and the river is rushing out at every low place on its banks."

"I think we'd better wait," said the father. "It will be as easy to get away a little later as it would be now."

Next morning he and Sam started out on a tour of inspection. Even during the night a great change had taken place, and now every rod of bottomland was submerged, save here and there a knoll or ridge. At home, the women folks waited in anxiety till the men should return.

Lize stood in the doorway, looking at the river, now a swift-running torrent, its coffee-colored waters, unable to find room in the ordinary channel, spreading far and wide in all directions.

"Where's Baby?" asked Lize, looking about. "She was out in front a minute ago, and—" The girl's heart stopped beating, and for a second she stood like one paralyzed; for there, on that fierce

LIZE ON THE RAFT.

river before her, was the boat, with "baby" in it! Somehow or other, the child, which was about three years old, had climbed into the boat, unfastened it, and was now about to be borne away on the current.

Lize rushed toward the bank, shouting something to her mother at the same time. Here she realized that even so good a swimmer as herself could not hope to battle successfully with that boiling river. The girl's heart sank, for there was no boat to launch in pursuit of the other; but she quickly remembered that there was a raft moored a few rods down stream—one made by Sam only yesterday for high-water emergencies—and to this she flew rather than ran. It was already afloat, and lying on it was a stout pole about ten feet long.

"You go back home and wait, mother," she cried to the frightened woman, who now stood wringing her hands on the bank above. "I'll get Baby, if I have to follow her to the Gulf of Mexico." The raft was cut loose by this time, and Lize leaped aboard and pushed it well into the current. A novel but terrifying chase now began.

The boat could easily have escaped had there been any one at the helm; but rudderless, it was the plaything of every whirlpool and eddy, while the raft, under Lize's guidance, pursued a steadier course, and held its own. It shipped many a sea, though, and she appreciated her own danger as well as Baby's. On and on sped the two crafts, Lize occasionally shouting words of encouragement to Baby; and there is no telling how long the race might have lasted, when the boat was seized by a new current, and sent flying through a break in the river bank into a forest of cottonwood trees.

Lize received a fresh shock at this sight; but putting new energy into her work, she managed to bring the clumsy raft near shore, and with it was shot through the break, just as the boat had been. She was almost thrown overboard, though, so swift was the descent. Recovering herself, she wielded her push-pole again vigorously, and was much gratified to find it more useful in the quieter and shallower water in which she now found herself. But the boat was far ahead, and colliding with trees in such a reckless way as to suggest that capsizing was also to be reckoned among the possible catastrophies. The raft, too, caught on different submerged objects, and otherwise behaved in an aggravating manner. In spite of these difficulties, Lize came within easy hail at last, and spoke cheering words to Baby, who sat quietly on the bottom of the boat, not quite sure whether she ought to enjoy her journey, or be frightened by the terror of it.

In the natural course of events, a capture of the fugitive would be the work of but a few minutes more; but surprises were in order on this singular chase, and the next one was a disappearance of the boat, with its youthful passenger, as completely as though the earth had yawned and taken it in!

Lize almost fell overboard from fright now; but in a minute the mystery was explained. The boat had pitched into a gully, much deepened by the water's action, and lodged in the branches of a prostrate tree below. But where was Baby? The boat was empty!

This question was speedily answered by a shrill wail of distress, rising above the roar of falling water, and in a fork of the overthrown tree Lize saw her small sister, resting safely and crying lustily; for, being tossed out of a somersalt-throwing boat into an old tree, was an episode of her voyage too decidedly uncomfortable to admit of a doubt as to how it should impress the traveler. Lize secured her raft, after poling it as near as possible to the latest scene of disaster, and then waded to the tree. By a clever bit of climbing, she quickly gained Baby's perch, and in a minute the brave girl was hugging and kissing that involuntary truant, who had suffered only a few scratches by her shipwreck.

It was not possible to get the boat afloat again, so Lize put Baby on the raft and dragged it slowly toward home. Luckily the water was too warm to chill, but fighting for each foot of advance was hard work, and even strong Lize might have given out had not Sam and her father soon appeared on the scene. They had started in search of her immediately on learning what had happened, though with little hope of finding either child; and, while making their way along the river bank, they saw Lize wading among the cottonwoods.

It was a joyful meeting, if a moist one, and when the whole party arrived at home, outpourings of genuine gratitude ascended to Heaven from that once more cheerful abode.

The river rose no higher that year, and before another flood came, Lize's father had built a house in a safer place.

Anecdote of Jenny Lind.

The following story offers additional evidence of the loveliness of Jenny Lind's character. She was once visiting at the house of the Reverend Christopher Smyth, rector of Little Houghton, England, and being out for a walk one day, it began to rain. The songstress sought shelter in a cottage, the mistress of which, though not knowing who her guest was, bade her enter and be seated in the best chair. Presently observing a canary, Miss Lind, or Mrs. Goldschmidt, as she then was, arose and began petting the bird.

"What is it's name?" she asked of the mistress of the house.

"Jenny Lind," was the answer.

"Why do you call it that?" inquired Mrs. Goldschmidt, much amused.

"Because it's the finest singer in the world," was the complimentary response.

"Have you ever heard Jenny Lind?"

"Oh, no, madame; such pleasures are only for the rich."

"Well, should you like to hear her?"

"Indeed, madame, I've heard about her so often that I think if I could hear her sing just once I'd die happy."

"If that is the way you feel," said the noble hearted cantatrice, "you shall certainly hear her. I am Jenny Lind, and you have just paid me a beautiful compliment, so I am going to sing for you. Now invite some of your best friends to come in and we will have a concert in your own house. If it is not so good as one in the theater it will not be because the 'Swedish Nightingale' doesn't sing as well as she can."

Scarcely able to believe her good fortune the hostess, although a very aged woman, bustled about and soon collected a few of her choicest old friends to share in the great treat. These Mrs. Goldschmidt arranged like an audience at one side of the room, and then, going herself to the other, she began singing "Auld Lang Syne," and other sweet, plaintive airs. While thus engaged Mr. Smyth entered, but the singer paid no more attention to him than if she had stood upon the stage of a theater and he had been a late-comer in the audience. At the close of the "concert" the situation was explained. The audience never forgot that afternoon, nor did their less fortunate neighbors ever cease to envy them their rare experience.

Some Happy Accidents.

E. A. MATTHEWS.

Some of the most celebrated discoveries in the world of science and art have been the result of a happy accident. The worker, striving earnestly for one thing, finds that, while failing in his original quest, he has attained another and far more wonderful one.

The discovery of steam was one of these "happenings," as we all know. The boy Watts, always thoughtful and planning, sat one day by his mother's kitchen fire. There was the tea-kettle swinging from its hook, and as the water grew hot, it began to boil, and the steam violently lifted the kettle lid. As it rose and fell, and the boy's eyes followed the motion, his brain was fired with the thought, "If this small puff of steam can move the iron lid, why would not a larger amount move a larger object?" and the whole subject of steam navigation was there in a nutshell.

The quick wit of a woman discovered the strange force now known as Galvanism. The wife of a celebrated savant, Galvani, of Bologna, Italy, was one day idly looking at some dead frogs, just skinned, for some purpose of scientific investigation, when suddenly the legs moved convulsively. She called her husband's attention to the phenomenon, and soon from that one small starting-point he evolved the wonderful theory and principal of the Galvanic battery.

Glass is made from melted sand, as all schoolboys know, but the discovery was one of merest chance. According to history, a number of sailors were shipwrecked upon the coast of Spain, and, building a fire on the sand to dry their dripping garments, found, after the fire died down, a crystaline substance, which was the first glass known to mankind.

Snuff-takers will smile to learn that their favorite delight was the result of a great fire in which a tobacconist lost all his stock. After the flames had subsided, he was wandering about to see if anything could be saved. He noticed that the poor people around the place were gathering up the half burnt boxes of tobacco. He thought it worthless, and made no objection to the depredation, when, by chance tasting and smelling a bit, he found that the heat had added a wondrous pungency and flavor to the original article. He was shrewd enough to profit by the discovery, and at once set about baking his tobacco in ovens, and the fame of his "Back-Yard Snuff" was established, and his fortune made.

The pendulum of our modern clock was the result of a chance look of Galileo, as he stood in a cathedral and saw the chandelier oscillate back and forth. He had the genius to apply the discovery, and thus clocks were invented in the year 1639.

The beautiful gloss and smooth surface of our satin fabrics are all the lucky find of an ordinary weaver. One day, when trade was dull, this man walked back and forth before his loom, thinking how he could increase his business. Each time he passed the machine he pulled short threads from the work, and carelessly placing them in his mouth, he rolled them over and over, and finally spat them on the floor. After awhile he picked up one of these balls of silk thread, and upon unrolling it, was astonished at their brilliancy. Catching the idea, he made experiments, and finally produced the beautiful satin.

Many more of these happy accidents might be mentioned: the fall of the apple that led Newton to the theory of gravitation; the flying kite of Benjamin Franklin, that drew down lightning from the skies; the bit of silver wire, that suggested to Dr. Marion Simms his great surgical theory; the discovery of modern porcelain; and of the principles of lithography. History abounds in these incidents, and, no doubt, the world will yet be enriched by many more benefactions resulting from a happy accident, or a careless suggestion lodging in an earnest, thoughtful mind prepared, by deep study over other problems, to receive it.

How Olive Conquered the Moonshine.

DR. EUGENE MURRAY AARON.

When Olive's parents moved into the mountains of North Carolina it was because her mother's health was so bad that the doctor said the change must be made if her life was to be saved. It was beautiful enough to suit any one in Fletcher's Valley, their new home, but it was very lonely for Olive, for their nearest neighbor lived almost a half mile away. Mr. Walcott had bought a little farm on the outside of the town, and Olive soon found out that she would have to play out of doors all alone, for baby was too little to do more than sit on the floor and crow with delight at the bouncing ball, or tumble over on his little pudgy nose when he tried to catch it.

Olive was a loving, happy girl, who wanted to do what would please her parents, but somehow things did not go as they used to in Bloomsbury. It was not alone because she had no little playmates. First, she had never been used to colored folks, and it seemed to her that she would never get used to the queer ways and queerer talk of Mandy, their girl. As for Abe, she could not help but run whenever he came in sight. He was always trying to win her good will by making things that she could use in her play, but try as she would, she could not bear him near her; he was so big and black, with shining eyes, and had such a loud laugh that just as she had made up her mind to stay and make friends with him, away she would scamper to the house as fast as her little legs could carry her. This made her understand how the squirrel and the catbird felt when she was too noisy, and after that she was very careful not to frighten them.

But that wasn't all the trouble. Nor because mamma was slow in getting well, and little brother an everlasting while in getting to use his legs. Much worse than all this there was something wrong with papa; something that Olive's six years did not help her to understand. The very days when she did her best to make mamma happy

were those when he was most cross and spoke the sharpest. She had never known papa so before, and when she asked mamma what it meant she got only tears and sobs in reply. Surely something was very wrong; but what it was she could not tell.

One day as she sat in the hammock with Mandy down in the kitchen talking to a friend from town, she listened sharply because they talked about her papa and her mamma's troubles. Some of the words they used were so strange, and much that they said so new to her, that she did not get it all straight. But she did manage to understand that the trouble with her papa was that he was too fond of the "moonshine" that he got over to Dave Bruce's. Mandy declared that if she only knew where Dave Bruce made this "moonshine," she would tell on him and have him arrested, for it made her "sick to see pore Missy Walcott cryin' her heart out every day."

This sounded very strange to Olive. Moonshine seemed so beautiful, making everything silvery white in all its glory, that she could not understand how it could make papa so cross and different from the dear, kind papa he used to be. The more she thought about this the stranger it seemed; until, at last, she ventured into the kitchen to ask Mandy what it all meant. But her question only seemed to frighten that good creature, as she threw up her hands, saying:

"Now, Miss Ollie, don' you say a word ub dat kin' to you pappy, or old Mandy'll hab to get out o' dis yere kitchen mighty quick. Dat moonshine what I was talkin' ub is mighty diffrunt from de kin' you know, chile, an' you better not say nuttin' about it to you pappy."

This was not much information, to be sure; but she was glad that it was not the beautiful moonlight that she loved so that had so changed her papa. To ask mamma would only make her cry, and so for a day or two she did much thinking, and had many secrets to tell the catbird and the squirrel.

Soon after this Olive, playing on the front lawn, with mamma and baby on the cool, shady porch, hearing the gate latch click, looked up to see a tall man with a sober face walk up to the porch and bow to mamma. Olive was busy trying to persuade a yellow butterfly to stay and play with her, but the last of the tall man's words caught her ear and made her forget all about the golden beauty under her wide-brimmed straw hat.

"Indeed, Mr. Williams, I know that my husband cannot pay that now," her mamma was saying; "but I will tell him about what you say."

"Pardon my outspokeness, Mrs. Walcott," was the reply; "but, as I have already put this settlement off once, I think I have a right to say that your husband would do well to pay more attention to this beautiful little farm and less to Dave Bruce and his 'moonshine,' if he is ever going to get me paid." And with that he bowed and walked away.

There was that word again! What did this "moonshine" mean? Olive, seeing mamma already crying, and thinking it could do no more hurt for her to ask the question so long on her lips, ran to her mamma, and jumping into her lap, kissed her over and over again, saying:

"Mamma, what is moonshine? Do tell me. I do so want to know, mamma dear!"

"I cannot, darling," with a fresh burst of tears; "when papa comes home you will have to ask him what that kind of 'moonshine' is."

That night, strange to say, her papa was in a very much better humor than usual; and when it came time for her to kiss him good night she was just about asking him the question when the thought of Mandy's fright made her change her mind, and with a warm kiss she was slipping down from his lap when he picked her up and said:

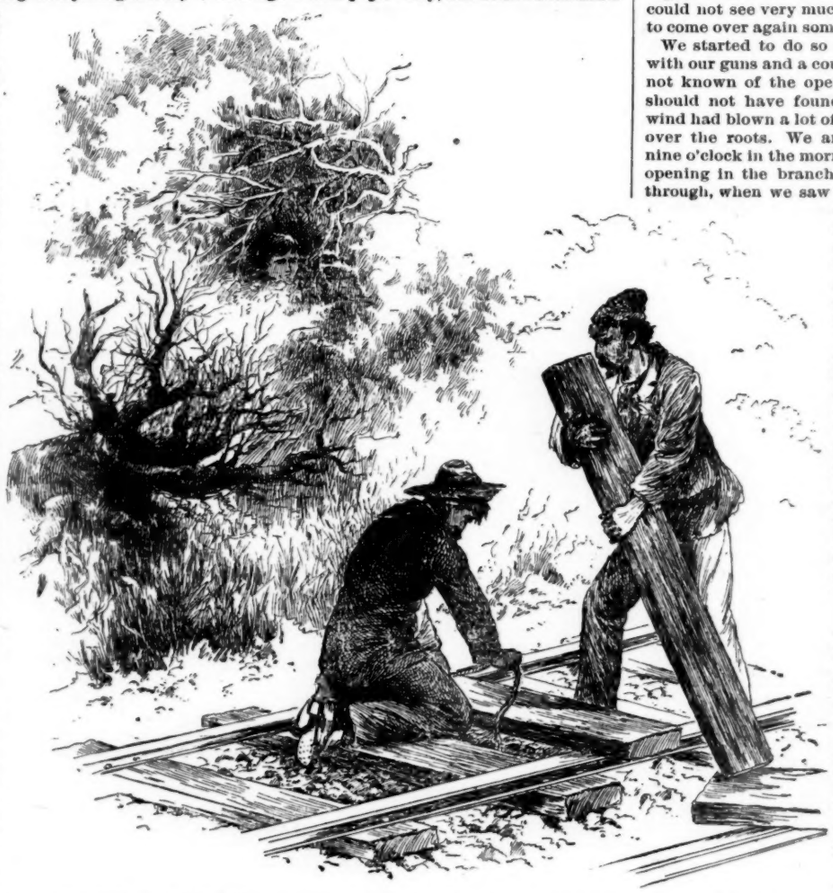
"My little tot hasn't said her prayers in papa's lap for so long. Don't she want to say them now?"

There was something in his face and voice that was like the old Bloomsbury days, and with bowed head on his shoulder she gladly began her "Now I lay me down to sleep." What it was that came into her little mind, who can tell? But when she came to the close of the oft-repeated words she ended:

"And bless papa and mamma and little baby brother; make Olive God's good little girl, and take away all Dave Bruce's wicked 'moonshine,' for God's sake, amen."

What had she done? Mamma crying was no new sight. But papa—why, she didn't even know that big, strong men knew how to cry. It couldn't have been anything very naughty, though; for papa held her, oh! so fast in his arms, and covered her little face with so many, many kisses. And when, at last, she toddled off to bed, pretty tired with all the hugging and the kissing, she looked back to see mamma in papa's lap, with her head on his shoulder, as she had not seen them for a long, long time, it seemed to her short memory.

It was not clear to Olive how her prayer had brought her so many kisses all mixed with tears, but that her request had been attended to by the good God she felt sure. He did not always make her as good as she ought to be; it must be so much easier for God to let little girls be naughty sometimes than to be always watching them, she thought. However, she felt quite satisfied about that terrible moonshine, for now papa seldom went away from home. It was laughing Abe who went to the store, and once or twice when papa did have to go to town he took her along, and they hurried back to mamma each time with some ice cream in a box before it could melt. And now mamma got well quickly, and did not cry any more, and that made Olive feel very happy.



"WE WATCHED THEM THROUGH THE OPENING."

Almost a Smashup.

H. D. TAYLOR.

Arthur Martin, William Otto and myself were classmates in the Bridgeton high school, and at the time of which I write were constant companions. The principal tie which bound us together was, undoubtedly, the fact that we were all good hunters, and each owned a double-barreled shot gun.

About five miles from our town a new railroad track had just been completed between Georgetown and Hardwick. At this point on one of our Saturday hunting expeditions for quail and rabbits, we discovered a cave under the roots of a big tree that had fallen over, near the railroad track.

We went into the cave and found that it had been formed by a small underground stream. At some time this stream must have been much larger, for it had made a passage considerably higher than our heads, and over six feet wide. We could not see very much of it, but we determined to come over again some day and explore it.

We started to do so the next Saturday, armed with our guns and a couple of lanterns. If we had not known of the opening before, we certainly should not have found it on that day, for the wind had blown a lot of dead branches and leaves over the roots. We arrived on the spot about nine o'clock in the morning and had just made an opening in the branches large enough to crawl through, when we saw two men coming towards us. Not wishing any one else to know about the cave, we hastily slid into the opening we had made and pulled the branches over the hole to hide it from sight.

We kept perfectly still, expecting the men would pass by, but they stopped and sat down on the trunk of the tree near where we had crawled under. They spoke in French. Will had studied that language a little, and he managed to catch a word here and there. We did not dare even to whisper, so we stood still for nearly half an hour, until the men went away.

Then Will said: "They are planning to wreck a train on the railroad. They have been discharged from their job on the road, and they want to get revenge. As near as I can make out they are going to wait until the freight train goes by, and then put ties on the track and wreck the passenger train that comes by about noon."

Arthur suggested that we shoot them at once, but this I told them would not do, for we could not explain why we did it, and might get into trouble. Besides, we had no right to take the law into our own hands. We watched them through the opening in the branches until after the freight train went by, and then they began to put on ties and bind them to the rails with ropes which they had brought with them.

After talking it over we concluded that there was no better way than to send Arthur out and let him run the risk of creeping through the woods without being seen by the men, and then run up the road and stop the train. We knew which direction the train was to come from the manner in which they put on the ties.

He had not gone more than ten feet from the tree when one of the men saw him, drew a revolver and fired at him. Arthur tumbled, and we both thought he was shot, but when the men started to run towards him, he jumped up and ran to the cave before his pursuer could stop and fire again. We pulled him in through the branches and found he had not been hit, but fell on purpose to deceive them. The men were at the tree a moment later, and one of them attempted to pull away the branches, but Will put the muzzle of his gun

through the opening, and said: "Touch that again and you are a dead man!" They held a hurried conversation in French, which Will at once translated to us in a low tone.

It appears that they decided to keep us in the cave until after the wreck of the train, and then tell the railroad authorities that we put the ties on the track, and that they had tried to remove them, but could not get them off in time to prevent the accident.

Suddenly I happened to think of the outlet of the stream. It must come out somewhere, and our only chance was to find it in time to stop the train. The obstructions had been put on just around a curve, so that the train would come upon it without any warning. I hastily whispered to the boys what I was going to do, and lighting a lantern I started down the brook.

At first it was quite easy going, but as I went farther along the water was deeper, and I had hard work to keep my footing on the slippery stones.

I struggled along, keeping my lantern and gun out of the water, and looking at my compass every few minutes to see which way the brook run. I had been over twenty minutes on the way and could not see that I was any nearer the end than when I started. I was beginning to think I should not get out in time, if I did at all, when a sudden turn of the brook showed me the daylight.

I was not long in getting out now, and found I had come out southeast of the cave and quite a distance from the tracks, not having crossed them, as I had supposed I should. I ran towards the road as fast as I could, and just as I came upon it I saw the train coming. There was no crossing near there, so no whistle was blown. I ran up the track waving my still lighted lantern. The train people saw me and whistled for me to get off the track, but instead I stood still and swung my lantern. Then they blew the whistle to put on brakes, and stopped just about where I had stood.

"What did you stop the train for?" asked the engineer, as he swung himself off the engine.

In a few words I told my story. Almost every man on board got off to see what was the matter, and some of them looked rather scared when they heard my story.

"All aboard!" shouted the conductor. "We will run on slowly and remove the ties."

"Can't we catch those fellows?" I asked, before he gave the signal to start.

"We can try," he said. "You take half a dozen men and pilot them to where these fellows are. I will give you five minutes the start, then I will come on with the train. The engineer can let the steam escape and make it sound as if the train was coming at full speed. The men will not run until they see the train stop, then you will be near enough to catch them."

A dozen men volunteered to go with me. We found one of the would-be wreckers watching the track, and the other the cave. A moment later the train, which could be heard but faintly, for the wind was the way to blow the sound off, came slowly around the curve and stopped within twenty feet of the ties. When the men started to run Will and Arthur sprang out of the cave and cocking their guns shouted, "Stop, or we'll fire!" Then I rushed out of the woods with the men who were with me.

When the train moved on, nearly an hour late, with the prisoners, the boys were for staying to finish our cruise, but the conductor wanted us to go on to the city and tell the officials of the road our story, which we did.

The passengers made up a nice purse of money for us, which we did not wish to take, but had to, and after the rascals were tried and convicted, we had a substantial reward from the railway.

"Blind?" cried Prescott, with his life work opening bright vistas before him. "Then I must have a reader and a penman." "You will not hear me?" shouted Disraeli to the stormy House of Commons. "But the time will come when you shall hear me!" "Never more enter the halls of Harvard?" exclaimed the paralyzed young student, who, having recently finished a translation of Dante, has passed away from this life of suffering. "Then send the examiners to my bedside." "Eternally deformed!" broke from the young lips of an English prince. "Yet I will be Richard the Third, and great, in spite of it."

An American girl (Dorothy Klumpke) is the first woman to take the degree of Doctor of Mathematical Science at the Sorbonne at Paris.

OUR LITTLE FOLKS.

Teddy's Easter.

DOROTHY BELLE.

"Oh mamma! you don't 'spose I shall have to stay at home Easter Day, do you?"

"No, dear, I hope you will be well enough to go out again by that time."

"You see, mamma, I *must* go, 'cause there's my lily going to blossom, and 'course I must go and see how it looks in the church. And then, 'sides, you know grandma could never find her hymns if I wasn't there to help her, and she says she must go to church Easter."

"Yes, my dear little boy, we will hope that both grandma and Teddy will be well by Easter, and that it will be so warm and pleasant that no one need stay at home. Still, Teddy must try to be patient if he should not get well quite so fast as we hope, and if it *should* storm—"

"Oh mamma, it dust mustn't rain on Easter Day! It's wained enough now, anyway, to last all summer, and if dose cattle you told me 'bout need more drink, they can just drink milk like I does."

"Let it rain!" papa said. But then, papa was a big man, and could go out when he pleased, rain or no rain. How Teddy did long for the time when *he* could do as papa did.

Still it might be pleasant Easter. Teddy tended his lily carefully, carrying it around from place to place where it would have the most sun, and putting it in a warm corner at night, so that it would be sure to open in time.

Indeed, the little fellow came near being too good to his pet one day. Some one had told him that warm water would hasten the blossoming, and mamma found him tugging away at a pail of boiling water that Bridget had carelessly left in the hall for a moment. Mamma explained that a little hot water in the saucer of the pot was what the lady meant, and she showed him how to pour it in.

This did beautifully, and now, the day before Easter, the lovely lily was wide open, and looked, as Teddy said, "Dust weady to fly up to God." It was a lovely warm day, and Teddy's hopes for to-morrow were very high. His little blue velvet suit was all done, and mamma said he might go with her in the morning early.

"So as to see the very first 'see' of my lily, you know, mamma," said Teddie.

"Yes, darling, if it is pleasant."

"And you'll be sure papa carries the lily over to-night, mamma," were the little boy's last words, as mamma tucked him up snugly in bed.

When Teddy woke up the next morning what was that dreadful sound he heard? Rain? Worse than that! Sleet, dashing against the window. It would be hard to tell which howled the louder for a while, Teddy or the wind.

Mamma came running in and took her little boy back to her own bed, and she and papa both tried to comfort him, but it was of no use. He would not be dressed, even, and "hated beasfus." No, he *didn't* want to hunt for Easter eggs in a nest," and he "didn't care for old, ugly Easter cards." Nurse brought up a nice breakfast for the little boy, then mamma had to leave him and grandma at home alone, for she was to sing in the chorus that day.

When she returned she found a good little boy, quietly listening to one of grandma's nice stories. The tears would come a little when mamma told him how lovely the church looked, and how Mr. Morton, the minister, sent his love to Teddy, and said his lily was the largest of any. But he went down to dinner with a smiling face.

Then he found, oh, so many little surprises on the table for him: "Boofer" Easter cards, and a lovely little nest made of sweet grass, with four little eggs in it. And then the dinner itself had so many of the things he liked best in it, and to crown all, "a truly-looking hen," with eggs under her, all made of ice cream.

Papa said he thought a disappointed little boy was a good thing to have in the family, if such a dinner was the result. He thought he'd try being disappointed some day. Mamma, you see, had quietly prepared all the nice things she could think of, in case it stormed.

After dinner Teddie and grandma sang carols together while mamma was gone again to take care of her class, and when she came home she took Teddy in her arms and told him all she could think of about the day. Then the door bell rang suddenly, and in came Mr. Morton bringing flowers for grandma, and for Teddy a large pot of violets, which were sure to blossom again in the fall. Then he held up his hand and said "Hark!" and just outside, close under the windows, were some of the choir boys come to sing carols to grandma and Teddy.

The storm was over now, and the stars coming out, so mamma wrapped Teddy up in a big shawl and opened the window just a little way. Teddy thought, as the boys went slowly home, singing all the time, that no music ever was so sweet.

To crown all, a week later a pretty photograph came to Teddy, marked "Interior of St. Luke's on Easter Day," with a little red cross to mark Teddy's lily. Mamma and Teddy said they surely thought their minister was the very "nicest" that ever was. And don't you?

Section Farm Puzzle.

Four friends, Henry, Walter, Charlie and Fred, decided to take up a section of land and divide it into four farms of equal area, each taking a quarter section of the same shape. They agree that each one shall make one proposition in laying it out that all will abide by.

Henry wants one-quarter of each farm laid out in forest trees as one large grove.

Walter wishes to have one entire side of the section for road frontage, with his carriage drive at the middle.

Charlie wants to build his house at the edge of the grove, with half of his forest trees on either side.

Fred wants each farm divided from the others, but wants each one to build a straight division fence in one direction.

Draw a diagram showing how the farms were laid out so that each wish was gratified.

For the best solution we will give a fine nickel-cased watch; for the second best, the AMERICAN AGRICULTURIST telescope, worth $3.00; for the third best, a card and scrap album, worth $1.00; for the fourth best, a World's Fair Souvenir, worth 75 cents; for the fifth best, an AMERICAN AGRICULTURIST jack-knife.

THE DECEMBER PRIZE WINNERS.

1, Emma L. Brown, Massachusetts; 2, H. A. Schuler, Pennsylvania; 3, C. W. Jenks, Massachusetts; 4, Minnie Schaefer, Kentucky; 5, Alma J. Carpenter, Pennsylvania.

The answer to the December puzzle will be found in the numbered words in the poem entitled "That Afternoon Walk."

That Afternoon Walk.

EMMA L. BROWN.

Come out for a walk o'er the country road,
In the bright and sunny summer weather;
We'll breathe the fresh air, and cull gay flowers,
As we take our quiet stroll together.
Many the beauties that greet the eye,
In garden, by river, in field and wood;
But we must not slight the plainer fry,
Which may be, like homely folks, useful and good.

(1) Bachelors' Buttons and (2) Barberry blooms,
With climbing (3) Bindweed to tie them in one;
And (4) Blackthorn, with stems like furry plumes,
Rejoice in the glowing summer sun.
By the old gateway the (5) Horse Chestnut stands,
With torches of pink, and yellow, and white,
Held out o'er the earth by its many hands;—

May we rob your branches, old tree, of a light?
Carefully tread in this moist little spot,
Close by the musical, gurgling spring,
Lest you crush in your haste (6) Forget-me-not,
The bluest, dearest, daintiest thing.
Here is a (7) Dandelion, somewhat belated—
Poor thing, its fellows have all grown old;
A (8) Larkspur, too. In color they're mated:
Put them together, the blue and the gold.

Over the wall climbs the (9) Morning-glory,
Blowing its trumpets low and sweet,
Telling softly its summer story,
To the (10) Lady's Slipper close at its feet.
Other things greet us as onward we go:
(11) Mushrooms to pluck and (12) Toadstools to leave—
Carefully choose we the friend from the foe,
Lest over our folly to-morrow we grieve.

(13) Wormwood and (14) Sage for a time of need,
When pains and bodily ills assail,
Our old Mother Earth is a friend indeed,
To yield us her solace for times when we ail.
Drop your wealth in this basket, my gentle friend;
With twining (15) Bittersweet cover it o'er.
We'll leave our trophies as homeward we wend,
At AMERICAN AGRICULTURIST'S door.

Fruit in the New Southwest.

Even in oldest Oklahoma it is too soon to certainly give it rank as a fruit growing country. In the newer additions of three and two years ago there can be nothing known except as to growth of wood. The country varies much more in altitude, climate, soils, and many other local causes that will effect fruit growing, than almost any like area elsewhere. At some of the forts and mission stations something has been done, and something indicated as to what we may expect. At the first meeting held by the recently organized horticultural society, it was decided that the country was yet too young to decide upon a list of fruits. In some sections there is a heavy growth of deciduous trees, and in other sections is a very stunted and gnarled growth. Except in plums and grapes, there is not much of a wild growth. For the whole territory peaches, plums and grapes are likely to be the standard fruits.

Apples will be fine in some sections, and raised with difficulty in others, and the same can be said as to small fruits. Long periods with but little moisture, and high winds, will work against their highest development in some seasons. Pears, if not affected with blight, are likely to do well. There will be but little trouble as to hardiness, as most fruits will pass through the dry, wild winters unscathed. It will be advisable to plant at first only those varieties that have an established reputation, that are known north, south and west, like the Ben Davis, Missouri Pippin and Wine Sap in apples, Alexander and Amsden in peaches, Duchess and Bartlett in pears, and Concord in grapes.

As to time of planting, considerable knowledge has been gained by experience, and while both fall and spring planting are practiced, yet I prefer planting in the fall, if there is sufficient moisture, or in early winter. Last year I planted from January until May, and had much better success with the earliest planted.

By planting thus early there is time for a complete settling of the soil about the roots before growth starts. As the soil is all new, and full of grass roots and an excess of vegetable matter, it dries out easily, so the ground should be thoroughly plowed and well and often cut with disk and harrow, and when trees are planted have the soil tramped solidly about the roots and then heavily mulched, and ground kept constantly loose and fine by cultivation, growing only small plants upon the space between trees. Unless extra attention can be given, it would be better to wait until the third year from the sod before planting. I planted hundreds of varieties the second year, but largely as an experiment, and would not advise it to the busy farmer, engrossed with the thousand cares incident to opening a new farm in an untried country.

J. M. RICE, Blaine Co., Oklahoma Ter.

The Crops in Nebraska.

The year 1893 was a very strange one in Central Nebraska. The winter was dry, following a dry fall. Winter wheat had a poor start, and the winter dry and cold, with no snow to protect the young plants, proved disastrous to the wheat crop. The spring was the counterpart of the winter, cold and dry. No rain fell until the 18th day of April, which came with a hailstorm. No more fell until May 22d, when we were visited with one of the worst hail and wind storms that ever came to this section. Not a vestige remained of the oats, wheat and corn that was above ground. Many windmills were torn down. Two more hail storms in June and July injured crops, but all these storms went in streaks, as did the rains all through the season. Hot winds, dust hurricanes and grasshoppers filled out the bill of destruction to crops. Corn was not half a crop on an average. Fields that the papers reported would yield sixty bushels to the acre, will not yield thirty bushels.

Oats yielded from eight to twenty-five bushels by measure, but were very light weight. Winter wheat yielded from two to eight bushels to the acre. A few miles to the west, where the rain went, it was much better, as high as twenty bushels being reported. Potatoes and garden vegetables are scarce. Of fruit there was none, a great many of the trees killed by the hail and drouth. Grass was a very short crop, and but little hay was put up. We usually feed grain nine months out of the twelve. More corn was cut last fall than ever before. The drouth may teach western farmers the lesson that corn cut before frost and properly cured, is worth far more than when left standing and stock turned in after the corn is husked, which is the easy and shiftless way generally practiced.

We had good rains in October and November. The moisture was greatly needed, and gave a little touch of greenness to the wheat fields. A smaller area of wheat was sown than last year, although the conditions of soil and weather were better. But there is not much money in wheat at thirty to forty cents a bushel and small yields. Good cows can be bought for from $25 to $30. It takes a pretty good horse to find a buyer at $50. The dairy business is the best of any, if one knows how to make good butter, and has the means to procure conveniences and feed for it.

F. C. JOHNSON, Adams Co., Nebraska.

From South Dakota.

The past year has been practically a failure, so far as our wheat crop is concerned, and the market price for the same. The agricultural depression appears to be of a general nature, extending over the entire world, and when it will end, no prophet has dared to predict. All in all, I do not think that here, with our cheap lands and free grass for our stock, that we suffer more than older sections of the Union do. There is this difference, however, that this is a new country and capital is scarce and keeps aloof, while in older sections there is more money and confidence. This, the northern part of South Dakota, has only been settled ten or twelve years, and many settlers have become discouraged and being deeply involved financially, have left to try their hand elsewhere, while now and then a few new settlers from adjoining States have come into the country, and not a few of the old ones have returned after an absence of two or three years, satisfied with Dakota. I believe that history repeats itself, and that we are and have been passing through one of those periodical financial depressions apparently subject to certain economic laws not yet fully understood by our best economists, neither political party being to blame for it. Many farms are in the hands of Eastern loan companies and for sale at a low figure, but there is little demand. Our county is practically out of debt and our county warrants will be worth one hundred cents on the dollar before next spring. The western half of this and adjoining counties west are gradually being settled by German and Russian emigrants, and real estate is holding its own. The American settlers of northern South Dakota can yet learn some things from these foreigners, who, as a class, do not use the word failure.

GEO. HICKMAN, McPherson Co., S. D.

As Others See Us.

While riding over country roads I have often asked myself why farmers set out so few trees, and I have thought that were I a farmer I would set out many, especially fruit and nut trees. I have never been able to obtain a really good reason for their not doing it. I suppose they think that they do not have time to spend in that manner. They might not think it would pay, but in after years they would think so. If I asked some farmer the question he would say, "What good will it do? I'll be dead and buried long before they would bear fruit. They would never do me any good." "But do it for your children, for posterity," I answer. "No, I won't do it," he replies. "If they want fruit they will have to set the trees, I will not." And this kind of farmer does not. Neither do his sons. And so in a few years the farm has no fruit trees, for the old ones are dead. Yet if the farmer had set out a number of trees and encouraged his sons to do likewise, they might not have wished to go to the city and the old farm when sold would have brought a larger price, for fruit trees increase the value of land. After a fruit tree has borne all the fruit it will it is still useful for fire wood, which is some consideration. If a person had all the fruit trees he wishes, let him set out some nut or other useful trees. It will pay. You cannot have too many trees if they are set where they should be. There is no use of saying more; people will do as they wish, advice or no advice. I cannot change them. But I know if I owned a farm, I should set out plenty of trees,

F. W. SHERMAN, Onondago Co., N. Y.

Spraying Apples and Grapes.

I have been spraying for six years with good results, but I never did the work so well as last year. As soon as the blossoms fell and the apples were as large as peas, I sprayed them very carefully. In a week to ten days I sprayed them again, excepting five rows, which I left to see if there would be any difference in spraying once or twice. I used one pound of London purple to 160 gallons of water, making the spray as fine as possible, and putting it on with force so as to reach every part of the tree. The trees that were sprayed twice gave ninety per cent. of a perfect crop. Where I sprayed once I got the codlin moth, but there seems to have been some insects which sting them more or less, so that there were not more than seventy-five per cent. of a crop of good apples. I am convinced that it will pay to spray apple trees twice.

Some years ago I was the only one in this township that sprayed and was the only one that grew a good crop of first-class apples. An orchard adjoining mine, planted the same time with the same varieties from the same nursery, promised up to the first of June a good crop when they commenced to drop, and when they were gathered there were not more than ten per cent. of a crop of good apples. My orchard has been in clover for a few years. I do not always cut it. If I do, the hay remains upon the ground to act as a mulch and assist in retaining moisture. Observation and experience has convinced me that bare, hard ground in July and August does not give the trees the moisture sufficient to perfect their buds for the following year's crop; also that mulching is the best cultivation. No one should grow a good crop of apples that is not willing to give the trees the entire use of the ground. I have been growing apples for over twenty years as a business, and have not had failure in the last seven years. The road to success is to feed the trees and kill the insects. My grapes were sprayed six times. My plum and pear trees were also sprayed, and all gave a good crop.

C. B. ROCKWELL, Hancock Co., Ill.

Prosperous North Dakota.

North Dakota people are attached to their climate. It has some objectionable features, but the year round it is a healthful and enjoyable climate. Its peculiarity is the large number of bright, sunny days, and the small number of days that are really inclement. Winter is a season of sunshine and not of clouds and storms as it is on the Atlantic coast. After a perfect autumn, in which plowing and other farm work goes on until late in November, cold weather comes to stay. The snowfall is not heavy, but there is good sleighing as a rule from the first of December until the middle of March. Three or four spells of extreme low temperature occur, when the mercury goes down to twenty or even thirty degrees below zero, but these spells are no more severe than is zero weather in New England. The air is dry and perfectly still. People are not nearly as much housed up as they are in the cold snaps of the East, and there are rarely a dozen windy days in an entire winter.

Spring comes with a bound, and a few days after the snow disappears and the roads are good, and seeding begins. The summers are warm and sunny, but there is no such oppressive heat as is suffered by the residents of New York, Philadelphia and Baltimore. The air is dry and that makes as great difference with the summer's heat as the winter's cold. Besides, breezes are almost constant in warm weather and the nights are cool enough for comfortable sleep. The autumn is the glory of the year. It is a long, cool sunny season of exhilarating air, perfumed with aromatic odors of wild flowers and shrubs, a time of hard, smooth roads, of gorgeous sunsets, of busy threshing scenes.

North Dakota's climate is a medicine for weak nerves and low vitality, as I myself can testify, and as thousands of her successful citizens were invalids, or semi-invalids when they migrated to her prairies. As an outdoor working climate it has no more drawbacks than the climate of Ohio, Indiana or Pennsylvania. In fact there are fewer

days when field work is suspended on account of bad weather than in those States.

A trip through the State of North Dakota reveals to the traveler that he has indeed reached the land of strife and activity, so wonderful has been the growth and improvement of every town and city. There has never been such a vigorous and substantial growth since the days when people rushed like droves of mad cattle to secure a farm of the wonderful and famous home of "No. One hard wheat." This frantic chase has ceased, and cool, well-calculating heads are now building up a new world, that in days to come will be remembered by the rising generation, as the place where their forefathers settled and acquired great wealth. Schoolhouses, churches and villages dot the prairies of North Dakota, and the people are educated, intelligent, and up with the times.

C. M. HARTWICK, Grand Forks Co., N. D.

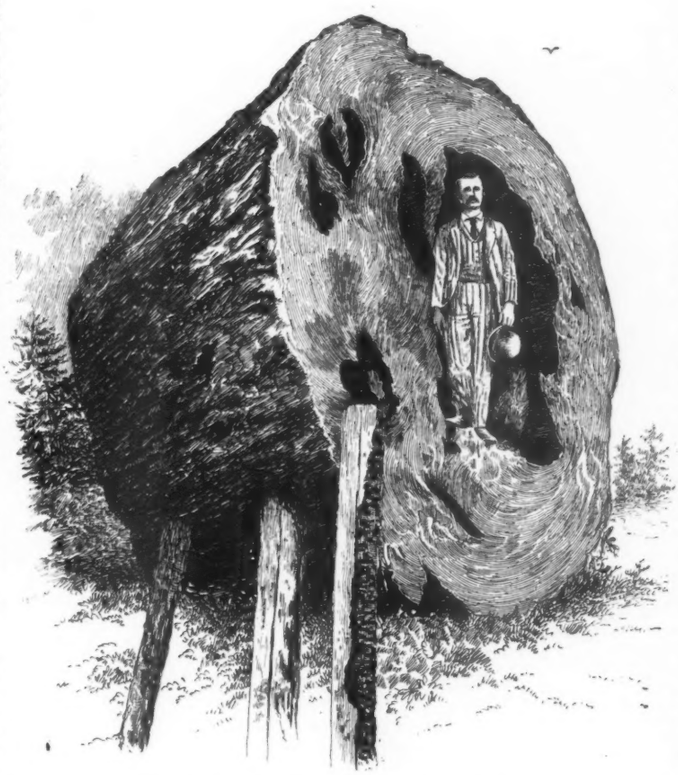
Cutting Masts in the Forests of Oregon.

The immense pine forests that lie along the western coast of Oregon furnish some of the best masts that are used in the shipyards of this country. The Oregon pine tree is tall, straight and tough. It tapers gracefully from the ground to the top, and when seasoned and ready to set in a vessel's deck, it is almost as hard as marble. The resin in the fiber of the wood preserves it against injury by the elements and keeps it from becoming dry and brittle. Much skill is required in cutting the trees that are to be used as masts. Sometimes they are sawed down but the means most commonly employed is chopping. This work is generally performed by expert Indian axmen, or experienced woodsmen, who spend the greatest part of their life in the pines. For use as a mast it is quite important that a tree is neither too young nor too old. It should be in the prime of life. The experienced woodsman can tell almost always whether a tree meets this requirement, at a glance, but now and then he is deceived, for it sometimes occurs that a tree will appear clean trunked and full of life outwardly, but is "shaky" and rotten-hearted. In either case it is useless. In cutting down a tree, two men are usually employed. They stand and chop on opposite sides of the trunk. The object of the choppers is to cut through the heart first. They direct their labor so that finally a hole is cut clean through the trunk of the tree at its center, and it is held upright by two thin strips on either side. When these narrow supports are cut off the tree falls. The object in cutting through the heart of the tree first is to prevent a possibility of the trunk splitting when it falls, as is frequently the case, and then, if the heart is not severed first, when the tree falls it is liable to pull out to a distance of several feet up the trunk of the tree, in which case the wood is valueless.

There is but little danger of damaging the tree trunk when a saw is used in cutting it down, but the method is unpopular because it takes a much longer time to accomplish the work. In sawing, two men are employed, a heavy crosscut saw is used, and the work is very tiresome as the men are obliged to stand with their heads bending down about on a level with their waists. When the tree is sawed half off, it is cut into from the opposite side. When a large tree is cut down in this way, it seldom falls until it is pried over. This is done by inserting wooden wedges into the cut made by the saw and driving them in with heavy beetles. In this manner one side of the tree is raised until the center of gravity is overcome, then it falls.

The trunk of every tree is "shaky" for some distance from the ground. "Shaky" timber is that in which the fiber has been loosened and separated. This renders it unsound and makes it liable to early decay. It is caused by the swaying of the trees in high winds, which subject the lower part of the trunk to a great strain. When the tree is down, from twelve to twenty feet of the butt is cut off, according to the solidity of the wood. The top is cut off and the tree is drawn to the river, where it becomes a part of a raft, destined for some distant shipyard. Some of the trees in these forests are of immense proportions, and it is not infrequently the case that one is cut down and found to be hollow, the cavity being large enough to admit of a man standing upright in it. Trees are often found there that measure from twelve to fifteen feet in diameter. [Our illustration below shows a section of the trunk of a large Oregon pine, the center of which was decayed.]

THOMAS HOLMES, Coos Co., Oregon.



SECTION OF THE TRUNK OF A LARGE OREGON PINE.

Rotation of Crops in Mississippi.

In this neighborhood the yield of cotton has fallen off fifty per cent. within the past ten years. To my certain knowledge there has not been one dollar expended for fertilizers on many plantations, and not one pound of homemade fertilizers applied to land that has been cropped annually since 1867. Clover and cow peas, or other leguminous plants must be resorted to at once, or there is certain to be a still further decrease in the yield. They will certainly not improve under the present plan of robbing the soil of everything. Occasional overflows are followed by good crops, this is easily explained by the fact that the deposit left on the land is highly fertilizing. The land here could, by a judicious course of rotation with peas and red clover, be restored to its former productiveness, and be made to exceed any previous yields. This, of course, would require several year's time, and will be difficult and expensive on large holdings. Small farms are easier looked after and can be made much more profitable than larger ones. Negro labor is the best cheap labor in the world, but worthless if left to its own guidance. The wage system is the only true system on a cotton plantation. It has been condemned as a rule by those who have tried it, yet it was not the system that failed. The negro prefers either lease or shares, as then he can do very much as he pleases, working about half the time. It is therefore difficult to obtain hands to work for wages, as they can lease for money or a share. If one is able to obtain the number required, you must permit them to do about as the share hand or the renter, or he will leave you at a time when you need his service most. It is this which has made the wage system a failure. If every one in the neighborhood employed wage hands, this trouble would be overcome. A sensible course on an average farm would be to commence next year, and plant at least one-third of the land in red clover or cowpeas, and change from time to time until the entire farm has been treated to the fertilizing legumes.

W. E. COLLINS, Issaquena Co., Miss.

The New Agriculture in the South.

The old style of farming is rapidly becoming superseded in the Atlantic coast States of the South, and the old time husbandmen are gradually adopting new methods. Many of them have begun to rotate and diversify crops, and to drain, ditch, manure, and improve stock. Some have bought improved machinery, and a few have made up their minds to work more days in the year. Formerly, under the old regime, the farmer would first get credit for his supplies, plant his crop, and then lie off until the harvest placed him in funds to meet his obligations. After the harvest was concluded he laid off again for the winter until the spring plowing. To-day every man seems to have thoroughly aroused himself, and farmers who are thrifty turn out three crops in a year. They not only grow their cotton, tobacco, peanuts, sweet potatoes, and corn, but they make their own meat, beef and pork, and return back to the soil, systematically, some part of what they annually abstract from it. Early vegetables, berries, and fruits are also receiving attention as money crops, and every year shows an increased acreage. Trucking has been the salvation of the effete South, as creameries have been the salvation of the "abandoned farms" of New England, and cheese factories of Northern Minnesota. In the Norfolk districts, which is the chief trucking district of the United States and the shipping port formost of the market produce of the tidewater counties of North Carolina, the business for 1893 amouted to $6,500,000, which is an increase of a million and a half in a single year. An income like this helps an impoverished community. It helps the people to furbish up. And this is what they are doing. They are painting the old farm buildings and putting up new ones; whitewashing the garden fences and buying new hats for the girls. Ten years ago the gates hung on one hinge, and old coats were stuffed into the broken windows. Railway construction and facilities for quick transportation have made this happy condition of things possible, for it now takes but hours to carry produce to market where it once required days. With these improvements come new men with new ideas, who help along the good cause of Southern agriculture.

CHARLES HALLOCK, Norfolk Co., Va.

The Outlook in South Africa.

Stock have been dying in great numbers, owing to the foot and mouth disease getting among them in the winter. Another cause was locusts destroying all the best grasses and crops in the summer. The lambing season has been a failure, owing to the very bad state of the weather in September, and most farmers, having no sheds or shelter, have lost nearly all of their lambs. We really are behind the times here, and whenever I read the AMERICAN AGRICULTURIST I wish that I could pay America a visit. Crops are looking very well, but stand in danger of being eaten by locusts, as these are just hatching now, and will be on the wing in a few weeks.

FRED P. HARRIS, Cape Colony, South Africa.

Would Rather Go Without Dinner.—I have been a reader of the AMERICAN AGRICULTURIST for several years and appreciate it so highly that I would sooner go without several dinners than without this excellent journal.

B. F. WOOD, Pierce Co., Washington.

One-Horse Power.—E. E. Parrett, Ashtabula Co., Ohio, asks: "If a one-horse power steam engine will raise thirty-three thousand pounds one foot high in one minute, how many actual pounds can it raise in one second?" If we leave initial velocity out of the question, we may say that the engine would lift the same number of pounds one-fifth of an inch in one second, or one-sixtieth of the thirty-three thousand pounds one foot high in a second, provided something did not break from the sudden compact or blow. It must be understood that the expression "horse power" is always to be considered in a qualified sense. Power means the quantity of work that can be performed in a given time; consequently time is an element which cannot be safely ignored in the generation and application of power in mechanical devices.

Propulsion in a Barrel.—Philip M. Brosher, Routt Co., Col.: We are inclined to think that the paddle wheels affixed to the ends of a shaft running through a barrel or other large, round vessel should, when they revolve, move the said vessel forward or backward through the water. Of course no great velocity could be attained by such an arrangement; but the vessel would probably move in the direction the paddles were turned. Having the power employed for turning the paddles on the inside, and worked by a man or a treadmill, would not in any way interfere with its movement through the water. It will be easy to try a vessel of the kind, and settle the matter practically.

Hedges and Hedge Plants.—A subscriber, Erie Co. N. Y.: The honey locust when wanted for hedges is always raised from seed. The seed can be purchased of seedsmen who make a specialty of tree seeds. A few years ago books on hedges were quite numerous, but the introduction of the barbed wire fence checked the demand for information about hedges, and the books on the subject are mostly out of print. The honey locust would be the best hedge plant for your locality, as the osage orange is rather tender in the North, and the hawthorn will sooner or later be destroyed by the round-headed apple-tree borer.

Hotbeds for Sweet Potatoes.—Winifred Clark, Okla, Tex.: Beds for sprouting and propagating sweet potatoes, are made on the same general plan as those used for starting early vegetables of various kinds. The beds are usually surrounded with a board from twelve to eighteen inches high, and covered either with glazed sash or oiled muslin, much depending upon the time the plants are wanted and the climate in which the crop is to be grown. To secure artificial heat for forcing the sprouts, fresh horse manure is thrown into the frames to the depth of from eight to twelve inches. After this is made level and tramped down it should be covered with two inches of soil, on which the tubers are placed when the manure underneath begins to ferment and heat is evolved. After the tubers are in position they are covered with fine soil to a depth of about three inches. Of course the beds must be watered and aired as often as necessary, and the sprouts pulled off when they reach a proper size. "Fitz's Sweet Potato Culture" gives full instruction on all these points and other useful information.

Whole Roots versus Piece Root.—C. H. Wise, Washington Co.: The question in regard to the difference in value of apple trees grafted on whole or pieces of roots was most thoroughly and fully discussed between forty and fifty years ago. The great apostle of the whole root theory at that time was a man widely known as "Terre Culture Comstock," who claimed that he had discovered the seat of life in plants, and its location was between wind and water, or in the crown in seedling apples. From the number of letters received lately from Missouri and Arkansas we conclude that terre culture has broken out afresh in the West, and tree peddlers are asking ten and twelve cents more per tree grafted on whole roots than those on pieces of roots. First-class apple stocks can usually be bought for five dollars per thousand, and if a whole one was used for each tree grown, it would only cost one-half cent. The entire subject may be summed up in a few words. All intelligent nurserymen use only good thrifty stocks, and if a seedling has a root long and strong enough to be cut into one, two or three pieces, and a cion attached to each, it is used; if not, the interior sections are thrown aside, whether they come from the top or lower end. When such root grafts are planted out and make a good growth, as they usually do, no man will ever be able to tell in after years whether they were whole-root or piece-root grafted trees.

Management of Farm Hands.—H. Bacon, Lincoln Co., Kan.: Whoever employs assistants should himself know his own business so thoroughly as to be able to direct all matters pertaining to his vocation, business and requirements. Otherwise, he must submit to the dictation, disrespect, or insolence of hirelings; or to all these in deep humility. To be master, one must master his calling.

Fattening Lambs and Calves.—Paul Dietz, Suffolk Co., N. Y.: Milk is the natural food for both lambs and calves, but flaxseed meal and wheat middlings may be advantageously added, in small quantities at first, and gradually increased in quantity to fatten. Though hay tea may not fatten like milk, yet fluid is necessary, even if it is but water. All ruminating animals require some coarse fodder. In season, grass is the best. It contains an abundance of meat-forming aliment. But in fall and winter good hay is the next best food. Three feeds a day will fatten faster than two, though the quantity be the same. All fattening animals should have a plentiful supply of pure water.

Sowing Mixed Seed Grain.—L. Y. Travis, Washington Co., Ohio: Many farmers find it beneficial to mix different varieties of grain before sowing. Both oats and two-rowed barley are mixed with spring wheat, only about a peck of oats or barley to a bushel of wheat. Of course this mixture is not marketable, but is preferred for bread by some persons to wheat alone. While the barley will ripen first it will not shell like oats by standing. For feeding purposes, or for grinding, buckwheat if sown with oats will increase the yield and prove an advantage. In sections where buckwheat is sometimes sown, oats are nearly always the succeeding crop, as very much of the seed from the former crop will yet germinate and appear among the oats, which are not injured for general feeding purposes. In sections where winter grain is not always a certain crop, many sow a mixed seeding of wheat and rye; if the wheat fills out, a fair crop of rye is obtained, being the hardier crop, which if both do well a satisfactory yield is the result. Millet is often sown with barley and sometimes with buckwheat.

Blanketing Horses.—Silas Jones, Lycoming Co., Penn.: The practice of keeping horses continually blanketed while in the stable is not a commendable one. This should be done only during severe winter weather, and even then it would be safer to make stables so warm that a blanket would not be needed except for an hour or so after the animal has been exercising and is warm. Even then a thin blanket is best.

Cross Pollination of Pear Trees.—J. Dudgen, Tasmania, Australia: In reply to the query in regard to pear orchards, it may be said that as the Bartlett is regarded as the favorite pear in the United States, and is the one most generally planted, more experiments have been made with it than any other variety. It is not known, however, that crosses are reciprocal, that is, Bartlett pollen is fertile on Anjou and Anjou on Bartlett. It has also been ascertained from experiments that both Beurre Easter and Duchess are fertile with Bartlett; and M. B. Waite, who has made most of the experiments upon this subject, says that Anjou and Duchess are fertile together. It is also likely that Beurre Easter will be fertile with either or both of these. Care must, of course, be taken to be sure that the different varieties bloom at the same time, for if one be earlier or later than another the pistils may not be receptive when the pollen is ripe, or the reverse. So, too, insects are a necessity for proper cross fertilization. Bees are probably the best agents, but any insects which visit the flowers and carry rather than eat the pollen will serve the same purpose. If the varieties are planted in alternate rows it will be much better than to have each one in a block by itself. You will not make any mistake in planting Anjou and Duchess together if they both bloom at the same time and are not planted in solid blocks.

Pointers for Potato Growers.—A. W. Litchard, Allegany Co., N. Y., gives the following rules to be observed in order to grow potatoes successfully: 1, Select only choice seed. 2, Do not allow seed to sprout before planting. 3, Cut seed so as not to put more than four eyes in a hill. 4, Plow deep and do it well. 5, Cultivate your ground thoroughly before planting. 6, As soon as the potatoes are up, so you can see the rows, cover them well. If thought best, cover them the second time, then let all your cultivation be surface work. Hill every time you cultivate. See that the bugs are looked after. 7, Dig as soon as ripe where there is no rot; if rotting, leave them in the ground until rot ceases.

Farm Wagon Brakes.—N. M. Sill, Bennington Co., Vt.: There are several patent self-acting wagon brakes, but while using a wagon with the box the common brake is a good one and can be applied by the driver while upon the seat, by the use of one hand or the foot. However, if you need the use of a brake while hauling loads of hay or grain upon a rigging, it is easily done by attaching the break beam to the wagon reach, or rear rounds of the wagon, connecting it with a half-inch rope that passes over a small pulley under the rear end of hay rigging and thence up the ladder to the driver. It is an effective arrangement, and those who make a business of hauling nearly two tons of loose rye straw to the paper mills, and down very steep highways, use it almost exclusively. Of course it may be applied to any loaded wagon where the use of the hand and foot brake is not practical.

Spring Treatment of Japan Lilies.—R. Peters, Hudson County, N. J.: In early spring, as soon as the lilies commence growth, carefully remove the soil from over the bulbs, and take away the sets that formed the previous year at the base of the stem, and plant them in some convenient place in the garden, and they will make flowering bulbs the coming season. Recover the old bulbs with six inches of good rich soil.

Scions by Mail.—D. Richards, Broome Co., N. Y.: Scions to be used for grafts should be cut before the buds begin to swell in the spring, and kept in a cool place until needed; if buried in a box of damp sand and placed in the cellar, they will not wither but be in fine condition at the grafting season. If to be sent by mail, cut to six or seven inches in length, or enough for two scions of three buds each. Tie firmly together, wrap damp moss about the bundle, and enclose in a wrapper of solid paper. Tie firmly, especially at the ends, to prevent evaporation. Attach an address tag and it is ready for mailing. It should arrive in good condition after even a week's journey.

Sterilizing Milk.—H. S. Denison, Clark Co., Ill.: Milk after being sterilized will keep sweet much longer, make better butter and milk, as well as be free from any germs of contagion. All that is necessary to sterilize milk is to heat it to 155° F. To do this fill a large can with water until it rises higher than the milk in a can set in this water. The milk can must have something under it to let the water pass freely. Keep the milk well stirred all the time you are heating it. Get the heat of the milk up to 155° F., and then take it out to cool gradually.

Preparing Cauliflower for Market.—J. Quilez, Havana, Cuba.: The usual method for preparing cauliflower for market, is to cut the leaves with a long, thin bladed knife, even with the top of the head, then put a piece of tea-paper over the head, tucking it under the stumps of the leaves, which will be two inches above the lower part of the head. Then place them in an ordinary flour barrel. For long carriage, cut off the outer leaves at the base, and wrap the remaining ones over the head, which will keep it moist and exclude the air; pack in shallow crates, and in such a manner that the

head will not get bruised. In this way they will keep in cool weather, for two weeks, and, when the leaves are cut off by the merchant, the head will look as fresh as if it had been cut but a day. The Long Island cauliflower growers are shipping in crates that hold half a barrel, and they bring as much in the market as full barrels packed in the usual way.

Management of Hatching. — S. B. Stanford, Texas Co., Mo.: If a sitting hen will remain on the nest when placed on imitation nest eggs, she will make a good hatcher. Dust her well with disinfectant powder to kill the vermin. Set two or more hens on the same day, and after the third day remove the unfertile eggs and put all the good eggs under one hen. Keep the others busy on the imitation eggs until you have eggs enough for them. A broken egg should be removed as soon as possible and the soiled eggs washed in warm water, but do not use dishwater or any water that has grease in it.

Saddle Horses.—R. N. Hutchinson, Wise Co., Va.: It is becoming fashionable for ladies and gentlemen in the larger cities to ride on horseback in the parks. The fashion evidently came from England where many ride either the real or imitation docked tail English cob horses that know how to walk, trot, and canter, and the riders relieve themselves from the severe jar when the horse trots by rising in the stirrup. The trained gaited saddle horses of Maryland, Virginia and Kentucky are not making much progress in superceding the English cob, though his running walk and rack make a remarkably easy seat. Fashion and not comfort seem to govern this matter.

Cream Not Whipping.—H. T. Inman, Franklin Co., N. Y.: Some dairymen are complaining that they cannot sell cream to confectioners that has been taken from the milk by the separater. The trouble seems to be that such cream will not whip, and therefore cannot apparently be used in making many kinds of confections. Just why cream will not whip that has been passed through a separater is not definitely known, but the cause is believed to be owing to the centrifugal machine throwing off viscous properties of the cream, which are found in an albuminous substance that causes the milk to stick to the butter fat, thereby making cream. Adding gelatin to the separated cream causes it to whip to perfection.

Making Goats Useful.—W. C. Hutton, Coles Co., Ill.: When male goats are gelded they grow to a large size and are very useful on the farm for working a light tread power for churning, pumping, etc., and have none of the bad odor of the male. A dog soon learns to absent himself when the time comes to use him, and sheep get so fat that it is distressing to work them in hot weather. The goat can be tethered and always found when wanted, and if a little wagon is made for him and there is a boy convenient on the farm, the two can be made very companionable, and sometimes a little work about the garden will be done by them.

Stumbling Horses. — T. N. Huxley, Story Co., Iowa: There is no horse more dangerous than one that stumbles by habit. If you are on his back when he goes on his knees you are liable to take a "header," and if you are driving him when he stumbles the ring is liable to pull out of the harness saddle and let the breeching fall, and the wagon runs on him, risking a runaway. No one seems able to account for horses stumbling. Some say it comes from weak legs or heavy shoes, or the horse being partially asleep. The latter seems the most plausible cause if it is not a habit, as it is with some horses. A bad stumbler is a dangerous animal.

Brewer's Grains and Silage.—F. Bailey, Harlan Co., Ky.: A complete cattle food does not exist in silage alone. Ensilage should contain all the elements of the natural grasses, to be a perfect fodder. Corn, when green, is too watery, and too poor in nitrogenous elements. Besides, it lacks the needed variety. So, indeed, is it with brewers' grains; they are not possessed of the full elements of fodder, as they have been deprived of much of the starchy matters in the extracted sugar formed from the starch of the malt. Neither are the grains nor the silage, when combined, perfect food, but need the addition of grain meals, at time of feeding, or previously added to make a perfect ration. But when green corn, green vetches, green peas, green millet, green clover, and the other grasses, are stored in the silo, then, and not till then, shall we have perfect green fodder for making June butter, and milk in mid-winter. Put all the good food in the silo in summer for winter use in order to obtain a summer quality of products. Brewers' grains may be added in the ensiling process when pure, sweet and fresh, with advantage and economy.

Mice Girdling Young Trees. — W. D. Jadwin, Dent Co., Mo.: The young orchard trees which are girdled on your farm should be examined to see if the mice have been at work on them. If they have you can get wire cloth for about two cents a square foot, and tie it around the trees and protect them. A little care at the proper time may save many trees. All mulch and weeds should be cleared away from the trunk of the trees.

Building Paper.—L. F. Kent, Jefferson Co., Ind.: Building paper is one of the most useful and inexpensive materials that can be brought on the farm. It is almost indestructible and fire proof, but best of all it is cold and wind proof. If put on the inside of the horse stable, cow stable, chicken house or even the ice house, it will pay for itself many times before it wears out. When applying it make good wide laps so the wind cannot blow in drafts through it.

Grafting Trees. — R. T. Kirk, Saline Co., Ark.: Knowing how to graft and bud is a useful accomplishment and only needs practice to meet with very fair success. Supply yourself with good tools, thread, wax, and other necessaries and go to work in the house on branches cut from the tree to learn how to graft properly. You will then know how to do it before active work begins out of doors. Not only fruit, but also many forest and ornamental trees may be grafted.

Nuts as Food.—W. A. Macdonald, London, England, writes us: Quite a stir has recently been created in Europe with reference to the value of nuts as food for human beings, and if this movement spreads, as there appears to be every prospect of its doing so, there will be a great impetus given to the value of the beech, for its nuts are one of the most delicious kinds of food. Much discussion has taken place regarding the relative values of cereals and nuts, the only important distinction between them being the excess of starch in the former, and the excess of fat in the latter. The beechnut settles this dispute by having a considerable percentage both of fat and starch, and it contains as much nitrogen as cereals, being also more nitrogenous than the average of other nuts. It may be added that the beech is the only tree whose green leaves are adequately suited to the human palate, so that in case of famine, or lack of other foods, they would occupy a conspicuous place. Also its wood occupies a high place as fuel and as an article of manufacture.

Dissolving Bones.—Subscriber, Parkville, L. I.: The process of dissolving bones with sulphuric acid on a small scale on the farm is attended with considerable danger. An easier way is to ferment the bones with fresh horse manure. If the bones are spread in thin layers through a heap of fresh manure, and kept moist, they will soon become soft and crumbly so that they will mix readily with manure.

Color of Swine.—H. D. Staley, Champaign Co., Ill.: Some years ago white was the favorite color for swine; but gradually the idea gained credence that a white color made them more subject to sunscald and mange. Though the skin of white animals is often more tender, this was probably only a notion, caused by the fact that any affection of the skin shows much more plainly on a white than on a dark-colored animal. For some cause the black and red colors have greatly superseded the whites, and caused a corresponding neglect of the white breeds in favor of the blacks. The only real value of color is to mark the different breeds, and, being only skin deep and readily assumed by half-breeds, is often, in the hands of tricky breeders, the means of deceiving buyers.

Curious Phases of Farming.—Geo. E. Walsh, Queens Co., New York: Farmers are engaged in raising many things for the markets, but of late years some queer novelties have become part and parcel of the farm produce. It is legitimate and wise forethought to make everything on the farm contribute something toward the general income. In some States skunks are bred on farms for their skins and oil, and a good sized animal is said to net the owner about $2.50. They are animals that can easily be bred if a good range is afforded them, and they multiply very rapidly, and have few enemies, except man, but they do much damage to poultry. In Pennsylvania and the western part of New York rattlesnakes are caught on the rocky farms, for there is a limited demand for the oil extracted from their bodies. The skins of a good size rattlesnake are also valuable, and will generally sell as trophies to would-be-brave hunters who resort to the hills and mountains for all sorts of wild game.

Domestic Pigeons.—P. L. Worth, Ocean Co., N. J.: Pigeons will pick their own living about any group of farm buildings, and if rightly managed are by many considered as a source of profit, but if managed in the usual manner and allowed to nest and roost at any point they please about the farm buildings, the annoyance far more than counterbalances the profit. Pigeons are very domestic, and will occupy any home provided for them. Partition off an accessible portion of the barn, shed, or other building loft for a pigeon loft, provide proper nesting places, roosting perches, and several entrances, or put up a separate structure in a sheltered locality. By keeping several varieties and taking the best specimens to the local fairs, several dollars in premiums are easily obtained each year. They multiply rapidly, and the squabs or young ones make a dish almost equal to wild game. The dark-feathered pigeons are considered the hardiest.

House Plants in Winter.—Mrs. H. A. Stafford, Monroe Co., Ohio: To succeed with house plants in winter, the first requisite is to be fond of them, and to such an extent that you are willing to take good and constant care of them. On a table near the window, they need occupy but little room. A southern exposure is, of course, very grateful to them, where they can get the sunshine, while heat that never falls below the freezing point is a necessity; but a hot, dry atmosphere is not so good as a cooler and more moist air. Furnace heat is quite objectionable, and a stove in the room is often very trying to plants, as both these means of heating dry the moisture out of the air of the room. Under such conditions it is well to keep a pan of water on the stove. The soil for the plants should not be so rich as to force the growth beyond that necessary for flowering. Be careful not to water the plants too often. Once or twice a week is usually quite sufficient.

Saddle Horses.—J Hovey, Union Co., Ky.: The farmer must look forward to the market for the colts he is now preparing to breed. The large prices that some famous trotters bring are a great temptation to breed the best mares on the farm to trotting stallions; but the outcome of such a cross is always disappointing to the farmer. It is not the man who breeds a fast horse that gets the big price for him, but the man who trains him. At present there is developing among the wealthy people of the cities a decided taste for horseback riding. The fad at present is for rough riding cobs with some style. This taste is borrowed from the English, and in all probability will soon be superseded by the splendid Racker of Kentucky. Their introduction into the large cities is only a question of time, and the man who first makes the venture on a large scale will probably make a great deal of money. At the same time such stallions on the farm will produce colts that should sell for good prices when properly trained.

Carrots and Parsnips.—D. S. Mapes, Pike Co., Pa.: The cause of your carrots and parsnips growing scraggy and forked is probably an uncongenial soil. If it is very light and sandy, and fresh barnyard manure is used, the roots are very likely to be rough and scraggy. A sandy loam is usually recommended for these roots, but we have noticed that the smallest and largest roots are produced in rather firm soils, approaching clay. Of course the soil must be worked deep, be free from stone and well enriched. Sometimes a drouth in the early part of the season, then followed by abundant showers, will cause a second growth, with more or less deformed roots. Try a heavy and rather tenacious soil, if you have such available.

FARMING IN FOREIGN LANDS.

A fruit-growers' convention is to be held at Mildura, Australia, July next, to secure a uniform nomenclature for the standard fruits of Australia.

The Acclimatisation Society of Auckland, New Zealand, is introducing opossums into the district. A consignment of twelve has been received and distributed, and more are to follow.

In reply to an inquiry in the British House of Commons, it was officially stated by Mr. Herbert Gladstone that anthrax had considerably increased in Great Britain during the last year.

Of all the dairy cows slaughtered in Edinburgh during the pleuro-pneumonia scare, not less than twenty-two per cent. were found by the official inspection to be more or less affected with tuberculosis. The fact is an unpleasant revelation of the extent to which the disease prevailed unsuspected.

Rose culture is increasing in Bulgaria to such an extent that many of the peasants have abandoned grain culture to raise roses. This is brought about by the increase in the price of the perfume, otto of roses, a syndicate in Turkey having bought up the bulk of all there was in market and then raised the price.

A strange mortality is reported as prevalent in New Zealand. If the skin of a sheep is cut in shearing, in certain wool-sheds, the sheep invariably dies, and the same mortality attends the docking of lambs in the same sheds. Some toxic germs are supposed to be contained in the refuse of the shearing sheds.

The French wine crop of 1893 was very superior, both in quantity and quality, notwithstanding the great drouth. The total product is officially reported at 49,800,000 hectoliters, or 1,095,600,000 gallons, exclusive of the crop of Corsica and Algeria. It exceeds by 20,700,000 hectoliters, or 459,800,000 gallons, the crop of 1892, and by a still greater excess the average of the last ten years.

A French scientist has been experimenting with bisulfid of carbon for clearing hen-roosts of vermin. He ties a few, uncorked, small bottles containing the insecticide on the roosts, and its vapor quickly destroys all vermin with which it comes in contact. Great care is necessary to avoid bringing a lamp or other flame in contact with the highly inflammable vapor.

The fruit growers of Auckland district, New Zealand, have organized a Fruit Growers' Union, for mutual protection and advantage. Its objects are to seek markets for their produce, secure the lowest rates for transportation, regulate shipments in accordance with the demands of respective markets, and possibly to purchase fertilizers in large quantities, for the use of its members.

Payment for milk according to the percentage of butter fats is becoming the rule in Australian and New Zealand butter factories, and the Babcock tester is coming to be as much a recognized need as the separator or churn. This is working a revolution in the local dairies by inciting the owners to weed out their herds, retaining those cows only which produce a profitable amount and quality of milk.

The culture of Zante currants has been undertaken in Australia with good prospects of success. One vineyard of twenty-two acres has been planted principally with them. The owners of currant vineyards hope to find them more profitable than raisins, as they are much more easily dried, and in less time. The local markets for currants are good, and the outlook for export trade is better than that for raisins.

The "dehorning craze" has reached Australia, where some interesting experiments in that line have been carried on by Principal Thompson of Hawkesbury agricultural college. He did not remove the horns of adult cattle, but merely cauterized the "buttons" on the heads of young calves, using caustic potash in some cases, and red hot iron in others. The results were uniformly satisfactory, no signs of horns appearing when the subject of the operation grew to maturity.

Those who regard London as a densely populated province covered with houses, will be surprised to learn from recently published agricultural returns that 14,000 acres, or one-fifth of the total acreage embraced within the metropolitan limits are devoted to agriculture and actually under crops. This is made up of 812 acres of grain crops, 2,840 acres of green crops, 401 acres of clover and rotation grasses, 10,182 acres of permanent grass-land, 333 acres of small fruits, and 360 acres of bare fallow. Within this area are kept 17,500 head of farm live stock—horses, cattle, sheep and swine.

Cattle-breeding is a leading industry in Honduras, the total value of cattle in the republic being estimated at over ten million dollars. The cattle are of the long-horned Andalusian race, the cows only yielding enough milk to maintain their respective calves, with very little surplus for dairy purposes. Stock of improved breeds can be safely imported only as calves, which become acclimated to the "Southern fever," so deadly to adult animals. Prices for dairy products are very high.

The great drouth and consequent bad harvests of last year rendered feeding stuffs scarce in Europe, and much difficulty has been met in finding rations for the horses of the French army. Algerian or Tunisean oats, with a hard shell and sharp points were tried, but were found injurious to the health of horses. The Minister of War has absolutely forbidden the use of hard-skinned oats, wherever they may come from. Barley has been partially substituted for oats, in the proportion of one part to four of oats.

Among the tropical productions introduced into Ceylon from South America is the Erythroxylon coca. It is a shrub indigenous to the elevated regions of tropical South America, where its leaves were used as a nerve stimulant by the aborigines as they are now by the whites. The annual production of the leaves is estimated at thirty million pounds, and is likely to increase since the extensive employment in the *materia medica*, either as plain extract or the alkaloid cocaine. It does well in Ceylon so far.

British authorities take very discouraging views of the prospects for wheat growing in the United Kingdom. The great obstacle to success is the competition of foreign producers. The British product supplies less than one-fourth the home consumption, while the United States and Canada supply fully one-half; the remainder coming from India, Hungary, Russia, and in small part from Australasia, Argentina and Chili. Large increase in the imports from the Canadian Northwest and Argentina are looked for in the near future.

Mr. Campbell, of Dwake, New Zealand, eradicates the Canadian thistle thus: "About twelve months ago I had a patch of these thistles on my farm, to which I applied a slight dressing of powdered brimstone by sowing broadcast with the hand, somewhat similar to sowing artificial manure. This wholly eradicated the weed. Brimstone is a never-failing cure for the thistle. It destroys all vegetable life, and ground treated as I have explained will not support life for two years afterward, but after that period has elapsed it can again be worked with satisfactory results."

The fertilizers and feeding stuffs law recently enacted by the British parliament provides that every person who sells any fertilizer, either manufactured in the country or imported from abroad, must give to the purchaser an invoice which states the name of the article, whether it is artificially compounded or not, and what percentage of nitrogen, soluble and insoluble phosphates and potash it contains. This invoice is to be regarded as a warranty. Similar provisions are made for feeding-stuffs, and heavy penalties are prescribed for any serious discrepancy between the invoice and the actual article to which it applies.

New Zealand presents a striking example of the dependence of public prosperity on agriculture. Not many years ago New Zealand appeared to be crushed under a heavy debt, incurred by an extravagant system of borrowing, and the Maori war. Instead of issuing more bonds the people and statesmen of the colony set themselves to developing its agricultural resources. The dairy and frozen meat industries have reached great magnitude, and nowhere is the farmer more prosperous. In a single decade the annual exports of frozen meat have risen from less than $600,000 to over $5,000,000, and the exports of butter and cheese have doubled in half that period.

Africa is stretching out her hands for a share of the coffee trade. A tract of land comprising about 32,000 acres, on the West African coast, has been acquired by a Liverpool syndicate, with a view of making it the largest coffee plantation in the world under single control. The land, which is under British protection, was acquired about two years ago for the cultivation chiefly of the best coffee, and already there are about 10,000 trees planted. It is intended to put at least 120,000 plants down within the next five years, and as the ground is said to be adapted for rubber growing, it is likely that this product may also be cultivated.

The Earl of Bective, whose death, at the age of 49, is announced by the English papers, had made his name widely known in America as a liberal and energetic breeder of Shorthorn cattle. At the great sale of the New York Mills herd, near Utica, N. Y., in 1872, Lord Bective's agent purchased for him the cow, Tenth Duchess of Geneva, for $30,000, besides other animals, at lower but still liberal prices. The deceased was son of the Irish Marquis of Headfort, but his seat was at Underley in Cumberland, England. He was not only a noted breeder of Shorthorns, but also took great interest in all branches of agriculture.

The tagasaste, or so-called "tree lucern," which was introduced into South Australia about twelve years ago, has proved very successful as a forage plant. Its nutrient qualities are similar to those of clover and most other leguminous plants, and farm stock, especially horses, eat it with great relish. Tagasaste is, in fact, a cytisus, *C. proliferus*, indigenous to the elevated situations of the Canary Islands. It grows on all kinds of soil, even the poorest, in climates adapted to it, and becomes a dense, spreading tree, unless kept cut back. It makes sufficient growth in two years from the seed, to come into use for stock. For situations which possess sufficient altitude, warm climate and sandy soil, it is a valuable plant, but experiments with it in California have not been attended with success.

The inquiries of the Royal commission on agriculture reveal deplorable conditions in many parts of England. In Pilling, North Lancashire, the testimony showed that farm buildings generally were very bad there. There being dairy accommodations at hardly any of the farms; butter and cheese were made in the kitchens, and kept in the bedrooms where people slept. Dr. Day said the water was shockingly bad, and that it was the cause of most of the disease in Pilling; it was got from pits and wells. The ponds contained water which was not fit for a cow to look at, being contaminated by sewage and drainage from the fields. On many farms there was so little accommodation that all the family slept in one room. Instances had occurred in which attendants upon cases of diphtheria had left their patients to go down stairs and make butter. Similar testimony was elicited in many other places.

The East Holstein Dairy Association comprises eighty private and eight coöperative dairies of the duchies of Schleswig and Holstein, the main object of the association being the sale of their own products. The bulk of these go to Hamburg, where an auction sale is held every Wednesday, mainly to determine prices for the week. The butter is delivered to the buyer directly after the sale by the manager, who receives payment for which he is responsible, and which he must send to the producers within five days of the sale. The manager receives one and one-half per cent. of the amount of the sale, and for this remuneration he is responsible for the payment, pays the transport of the butter from the station to the auction, finds the premises for and pays the expenses attending upon the sale. There is no government fee charged. The members of the Union further pay one-half per cent. to the Union, principally for paying the consulting dairy chemist.

Mr. R. Pell Edmonds, a South African flock-master, writes to the *Agricultural Journal*, of Cape Colony, a very gratifying account of his experience with Vermont merinos, of which he has eight bucks and five ewes. His original flock consisted of Australian merinos and he found that they "were opening on the back, getting very thin on the belly, with a great deal of watery or wasty wool." He adds: "I find the first cross with Vermont rams has completely done away with the watery wool and the opening on the back, and has made a great improvement in the belly wool, and has given me an increase in weight per sheep, stated at the very lowest average of two pounds." Samples of the wool were submitted to an expert who pronounced it "very strong and an extra supercombing wool." Finally, he says: "I had shorn just before the late heavy rains set in and found that the sheep least affected by it were the half-blood Vermonts, owing to their dense covering. I find them very hardy, short on the leg and compact in carcass, and altogether desirable."

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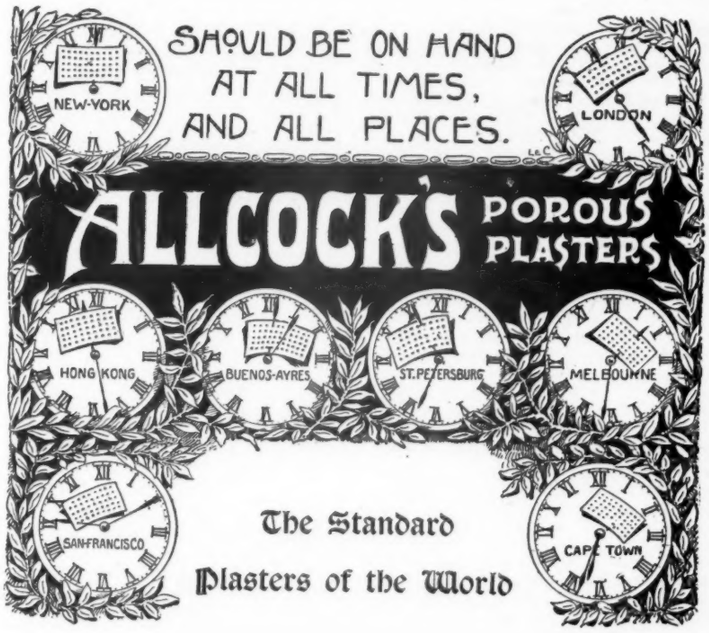

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SCIENCE IN FARMING.

Surface Irrigation or Sub-Irrigation.—It is generally believed that irrigation water applied beneath the surface is better than surface irrigation, using less water, keeping the soil warmer, preventing excessive evaporation and washing, and improving the yield and the quality of the crop. Experiments by J. W. Sanborn at the Utah station (B. 26) with sub-irrigation on the farm, through perforated cement pipes over a gravelly subsoil, indicate that the system is too costly for ordinary farm crops. Sub-irrigation, whether by large open drains or by cement pipes, failed to supply enough moisture for the growing crops. With pipes twelve feet apart the lateral movement of water in the sandy loam was too slow to furnish the requisite supply for the evaporation of plants, being at the rate of a very few inches per day. The sub-irrigated soil was warmer than the surface irrigated soil. The atmosphere around the plants, to the height of twelve inches, was warmer than by surface watering. The sub-irrigated plat contained less moisture, and there was a consequent decrease in the crop yield.

Sub-Irrigation in the Forcing House.—Experiments with sub-irrigation through perforated tile and pipe in the greenhouse at the West Virginia station by F. W. Rane (B. 33) indicate that sub-irrigation is the most complete system of watering. The soil does not become surface-hardened, nor do the beds bake or dry out in the bottom. The apparent moisture in the soil is not deceiving, the roots run more evenly, fungus diseases are held in check, and there is a great saving of time and labor. The soil can be worked at any time, and thus kept in better condition. Less water is needed, the beds requiring watering but once a week, while surface irrigation needs it daily. The yearly excess of cost from laying the tile in a house twenty by fifty feet was $8.86. The pipe and the tile serve both to water the beds and to retain the excess of moisture. The openings underneath the soil allow free access of air, preventing the soil from becoming sour or stagnant. Parsley and spinach matured earlier, there was a marked gain in the production of tomatoes, lettuce was thirty per cent. better and its rot was held in check. Long rooted radishes did best, and the under leaves of all plants dried up without becoming slimy and decayed as they do in surface watering. Sub-irrigation thus proved itself more economical and satisfactory.

Cucumber Beetles.—The striped cucumber beetles which appear early in May, do most damage while the plants are very young, and J. B. Smith of the New Jersey station, states (B. 94) that cucumbers, melons, and squashes may be saved by planting under glass, in baskets, and setting out after the vines are started. Or an excess of seeds may be planted, so as to distribute the insect attack, any superfluous plants to be thinned out when the danger is over. When the plants are established and the beetles appear in dangerous numbers, spray with the arsenites, or dust with arsenites and plaster, or dry slaked lime. The sixteen spotted beetle feeds openly, on the upper side of the leaf, and is easily within reach of insecticides. The arsenites are the most effective, and should be sprayed on the plants when the beetles are first making their appearance. Killing off the adults early will prevent egg laying, and, consequently, the production of larvæ. The season's brood may be easily destroyed by spraying with a solution of one pound of Paris green or London purple to one hundred and fifty gallons of water.

Spraying Orchards.—During a warm spell in March or April, fruit trees may be sprayed with copper sulfate solution, or with kerosene emulsion. E. G. Lodeman of the New York Cornell University station, recommends (B. 60), that the trees be far enough apart to allow of the passage of a wagon carrying the solutions. The orchard spray pump should be large, the amount of liquid needed to spray a full grown apple tree being about four gallons. The number of applications necessary to protect apples from the scab fungus is variable. As a rule the fungicide should be applied at least once before the trees blossom, and two applications are necessary after the falling of the blossoms, upon those varieties easily injured by the scab. Many susceptible varieties will repay one or two additional sprayings. Resistant varieties need only one or two applications. The advisability of making more than one or two spraying applications to Baldwins and Fallawater apples is doubtful. King, Maiden Blush, and Fall Pippin apples will repay from four to six applications. Red Astrachan may be treated three times. Bordeaux mixture proved the most effective fungicide, followed by ammonical solution of copper carbonate, Paris green, and fostite. London purple is as good as Paris green, provided it contains as much arsenic. Two applications of the arsenites are sufficient to control the ravages of the first brood of codlin moth larvæ. Tho arsenites are equally as effective, sprayed alone, or with fungicides. Lime greatly reduced the caustic action of Paris green. Fungicides may intensify the color of the apples, and will keep the foliage healthy. Fall Pippins were double in size, and both they and Maiden Blush apples kept longer from the early spraying with Bordeaux mixture. Spraying increased the market value of the apples at least $1 per barrel both in size and appearance.

Northern Strawberries.—Fifty crosses of strawberries made by the New York Geneva station were exhibited fruiting in pots at the World's Columbian Exposition. From these and other crosses, S. A. Beach reports (B. 64) that systematic breeding may be expected to give more rapid improvement of cultivated strawberries, than will the introduction of chance seedlings. Johnson's Late appears to be a desirable parent for use in breeding late varieties of strawberries. Lennig's White was found to be very prepotent in transmitting the color, flavor and shape of its fruit to its seedlings, which, however, generally appear to be undesirable except for home use. Dawley seedlings gave a large proportion of excellent varieties. Sharpless seedlings gave many choice varieties, which were noticeable on account of the vigor and productiveness of the plants, and the scarlet color and good quality of the fruits. Of the standard varieties, Michel's Early and Feicht's No. 2 took high rank in 1893 as early strawberries. The best late berries were Townsend No. 2, Edgar Queen, Princeton Chief and Sunny Side. The latter made the best record of the newer varieties tested.

The Apple Scab.—Experiments at the Maine station, as reported by W. H. Munson (R. 92), attest that spraying apple trees with copper solution proves an effective means of checking the apple scab. The average increase in the amount of salable fruit on the trees sprayed with the least effective solution over that on the unsprayed trees was thirty per cent. The trees sprayed with a solution of two pounds of copper sulfate, two and a half pounds of carbonate of soda, one and a half pints of ammonia and thirty gallons of water, were increased nearly fifty-two per cent. in marketable fruit. The latter proved more effectual than the usual ammonio-copper carbonate solution, but, as used, caused a slight injury to the surface of the fruit. The best results came from spraying early in the season before the blossoms opened, though repeated applications of the fungicide during the season were beneficial.

Remedies for Plant Diseases.—For the various enemies of plant life, C. W. Woodworth of the California experiment station, recommends (S. B. *A.*) the following procedures: For fungi in general, use dilute Bordeaux mixture, made as follows: For every ten gallons, take a pound of lime and a pound of blue vitriol or copper sulfate. Dissolve these separately in hot water and mix when cool, adding water to make ten gallons. Spray on the plant alone or combined with the ammoniacal copper carbonate solution, made by dissolving one ounce of copper carbonate in six ounces of ammonia and adding ten gallons of water. For powdering mildews use sulfur, dusting it on the plants. For scale insects use a resin soap made as follows: For 100 gallons for summer use take 18 pounds of resin, three and a half pounds of caustic soda, and two and a half pints of fish oil. For winter use, use thirty pounds of resin, six and one-fourth pounds of caustic soda, and four and one-half pints of fish oil. These materials are covered with five inches of water and boiled in a covered kettle for two or more hours, when water is added to make 100 gallons. Spray on the plants. The scale may also be killed with gas, by covering the plant with an oiled tent, and for each 100 cubic feet of contents place in a bowl beneath the tent two-thirds of an ounce of water, one-third ounce of sulfuric acid, and one-third ounce of potassium cyanid (58%) being careful not to inhale the poisonous gas, nor to allow it to escape from the tent for a half hour. The leaves may be injured if this is used during the middle of the day. For insects in general, use kerosene emulsion, made as follows: Dissolve a half pound of soap in a gallon of water. Heat this to boiling and add two gallons of kerosene. Pump it through the spray pump, with good pressure, for five to ten minutes. For spraying add ten times as much water as there is emulsion. Sour milk may replace the soap solution. The emulsion is made more effective by the addition of a very small amount of arsenic to the soap solution, or of buhach to the kerosene. For fruit or leaf-eating insects, use Paris green or London purple as a powder at the rate of one to five pounds to the acre, distributed by walking or riding over the field, carrying a pole, at both ends of which, are hung muslin bags containing the poison. As a spray, use one pound to 200 gallons of water. In spraying these arsenites, the nozzle should be held at some distance from the plant and no more applied after the leaves begin to drip. Do not use them on crops where the food product might thereby be poisoned.

The Stability of Fat in Sweet Milk.—The effect of allowing milk to stand, cool, cream and sour, upon the determination of its fat content, is of especial interest to those who are now using or contemplate using the method of buying or selling milk and determining its value according to its fat content. It is desirable to know whether allowing the cream to rise, or the milk to sour, will affect the percentage of fat. According to tests at the Maryland station by H. J. Patterson (*Agr. Science*, 1892, pp. 553-6) the time of sampling and making of the test, the cooling, the creaming, and even the slight souring of milk, does not materially affect the per cent. of fat indicated. The slight variation in results are within the limits of error allowed for duplicate determination, and can not be attributed to the effect of time, until after the milk has soured sufficiently to thicken. After the milk sours enough to thicken or "clabber," there is an appreciable loss in fat or decrease in percentage observed. The time for which milk can be kept sweet and free from coagulation, can be greatly prolonged by the use of preservatives. The greatest variation in the fats, up to the time of the milk thickening, as shown by the tests, amounts to less than one ounce of butter per one hundred pounds of milk. Thus the testing of milk for fat before it has lost its animal heat, or while very fresh, has no practical advantage or disadvantage.

The Russian Thistle.—The Northwest is being rapidly invaded by the Russian thistle (*Salsola kali* S. var. *tragus* D. C.) and C. E. Bessey of the Nebraska station recommends (B. 31) that the residents in every neighborhood co-operate in order that no weeds be allowed to grow on lands outside of tilled farms. Cultivate, until the first of August, all land likely to grow the weed, after which it will not have time to spring up and mature its seeds. If, in spite of efforts, the weeds do appear, cut them down by the first of September, before the seeds have formed. If cutting is delayed beyond the tenth of September, the weeds should be burned as soon as dry enough. All land not in grass should be kept cultivated. If a non-resident landowner has land broken up he should be notified that he should keep it free from weeds, and especially from the Russian thistle. Carefully examine flax and Hungarian grass seed for seeds of this weed. It is said to have come to South Dakota in flaxseed. Sheep readily eat the young plants and may be pastured on the infested lands early in the season, but the plants which escape the sheep should be removed. In the fall make bonfires of all the Russian thistles that can be found. Aid in the passage of a law which will compel the non-resident owners of land, the railway companies, the street and road commissioners, village corporations, and all careless persons to do their duty to the community by keeping their lands free from this baneful weed. Let the road-masters be made weed inspectors for their road districts, and let it be their duty, at least, to keep the roadsides free from Russian thistles. It would be well, also, if every constable should have the power of a weed inspector, especially with reference to unoccupied lands and railways. Every citizen and every child in the public schools should be made familiar with the appearance of this pest, in order that he may destroy the Russian thistle wherever it is found.

American Food Products Abroad.

Americans have been too careless about exhibiting their food products and labor-saving inventions abroad, as a rule, though the Paris expositions of 1878 and 1889, are notable contradictions. The success of exhibitors there ought to stimulate producers to increased interest in the coming exposition at Antwerp, Germany. American food products must be cleared of the reputation of being adulterated, and full exhibitions will do much toward it. The analyses published by boards of health are not always creditable to American flour, lard, canned goods, and other products, and these injurious effects are augmented by the hostility of the German press. This same press can look at home and find quite as much adulteration as it finds in this country.

There is nothing to show that European live stock is any healthier than American. A larger part of the butter, cheese, and milk sold in their cities is adulterated. Of 1,000 samples of butter bought in open market in Berlin, 174 were adulterated, in some cases with fully 60 per cent. of oleo. Cattle plague and hog cholera have occasioned losses to German farmers of millions of dollars per annum, and as a consequence all neighboring states have prohibited the introduction of German animals. Meat inspectors in Saxony reported that out of 61,000 cattle butchered for food in 14 German cities, 12,000 were tuberculous. The director of the Berlin slaughter house reports about the same proportion unfit for food by reason of disease. This shows that American producers have a large field in Germany, and the Antwerp exposition will be a good opportunity to demonstrate the purity of American food products. Those in charge of exhibits ought to be able to speak French and German so that they can communicate intelligently with all inquirers.

The Bud Moth.—B. W. Negus, Lancaster Co., Neb.: The insect which attacked your apple trees last summer, destroying buds, leaves, and blossoms, is known as "The Bud Moth" (*Tmetocera ocellana*). The webs and dried leaves on the twigs you sent are well filled with the minute cocoons, from which we obtained several live specimens of the small brown worms or larva. We were somewhat surprised to receive this pest from Nebraska, but it merely proves that it is making its way westward more rapidly than we had supposed, although for several years past it has been very destructive to the apple and pear in Western New York and Canada. It is an European fruit pest, on its way westward, but was noticed in this country by Dr. Harris as early as 1841. As for remedies, we would suggest cutting off as many of the infested twigs this winter as possible and burning them. Also burn all the leaves under the trees, because many of the cocoons fell from the twigs last fall, and are now on the ground. In spring, just as the leaves begin to expand, spray with Paris green, using one pound of the poison to one hundred and fifty or two hundred gallons of water.

Information Not Otherwise Procurable.—I have been a subscriber to the AMERICAN AGRICULTURIST for several years, and by reading it carefully I have gained a great deal of valuable information that could not have been procured in any other way. MAURICE H. GATCHEL, D. C.

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TOPICS OF THE TIMES.

The Movement of Population Townward.

WHAT THIS MEANS TO FARMERS AND ITS RELATION TO NATIONAL PROSPERITY.

The extent to which the tide of population has turned against the farm is revealed by the census data, the first publication of which is being presented in the AMERICAN AGRICULTURIST from time to time. The total population of the United States increased about one-fourth during the ninth decade, but the gain in the number of farms was only 14 per cent. Now in the previous decade, 1870-'80, population increased about 30 per cent, but the number of farms increased 51 per cent.

DISTRIBUTION OF POPULATION.

Population.	1890	1880	1870
On farms	25,900,000	22,700,000	15,110,000
Other	36,722,250	27,455,783	23,458,271
Total	62,722,250	50,155,783	38,558,371
On farms	41 %	45 %	39 %
For every 100 families there were farms	37	40	35
Farm population inc. during decade	14 %	50 %	30 %
Other population inc.	34 %	15 %	17 %

Here we have the strongest confirmation of what was generally assumed to be the fact, that population was seeking other occupations than agriculture. It shows that the consumers of farm products are increasing much faster than are the producers. But it will not do to base too much confidence on this growth of population faster than numbers of farms, as Mr. C. Wood Davis is in danger of doing. His discussion in the New York *Sun* of February 4th of this topic, is instructive, though somewhat overdrawn. He is probably not aware that the area of improved land in farms increased in just about the same proportion as did population during the ninth decade. This was also the case in the eighth decade. Thus though numbers of farms did not keep pace with population, the increase of cultivatable area did keep up. This explains the continuance of our large supply of agricultural produce in the face of a relative falling off in the number of farms. Tables giving the details of these facts will be printed in the AMERICAN AGRICULTURIST for April—their first publication.

Readjustment of the tremendous agricultural development from 1870 to 1885 has been in process for several years. Mr. Davis is only a little ahead of the times in his views. He speaks truly when he says:

"Aside from and wholly independent of commercial and fiscal politics and currency conditions, the fact that the rural or farm population increased 50 per cent. between 1870 and 1880, as against an increase of 15 per cent. in the urban element, accounts completely for the great prosperity enjoyed by that part of the nation engaged in fabrication, construction, distribution, and in professional, personal and public service, just as it accounts for that plethoric condition of the granaries of the world which has resulted in world-wide agricultural distress; and, by the destruction of a great part of the farmer's purchasing power—as a result of declining prices due to a too rapid development in the Mississippi and Missouri valleys—has added so potently in producing commercial and industrial stagnation in nearly every country inhabited by peoples of European lineage."

Mr. Davis constructs some ingenious tables showing the relation of population to farms, by employing the census of the number of farms in 1890 as first published in the AMERICAN AGRICULTURIST for December. He assumes that families on farms are ten per cent. larger than other families, and adds six per cent. to the total thus obtained for farm laborers, upon which basis the above table is got. Assuming that only the families living on farms represent the actual rural population, he shows that during the ninth decade, the urban population or consumers of agricultural products increased at a rate two and one-third times as great as that at which increased the rural population. He estimates that the farm people have increased only one-sixth as fast as the urban during the past four years. Without following Mr. Davis into his field of estimate and assumption, the census warrants in a general way the following conclusions:

1. The arable public domain is practically exhausted.

2. There is no place in the United States where a great body of people may create new homesteads and find employment upon new farms.

3. Much unimproved land now embraced in farms may be improved, and these farms may be cut up into smaller areas; while the settlement of really new lands must be restricted by their comparative scarcity.

4. The foregoing conclusions, with the low prices of farm products and the comparatively higher returns hitherto paid to labor in other vocations, will probably continue to drive people into towns and cities until these other vocations are brought down to the farmers' level of profit, or agriculture is brought up to their level of prosperity.

5. Then, and not until then, are we to see any great movement of population to landed occupations. Meanwhile, indications point to a gradual improvement in American agriculture, provided the land is kept in the hands of and reserved for the people.

6. These facts, and this trend away from the farm, whereas in the eighth decade nearly two-thirds of the additions to our population found homes and work upon the farm, as Mr. Davis points out, "give us some adequate conception of the tremendous significance of the change which has obtained in the distribution of population, and of some of the economic, industrial and social dislocations likely to result from this movement townward."

Changes in the Size of Farms from 1880 to 1890.

There was a slight tendency toward larger rather than smaller farms. This is a turn about from the tendency of the previous thirty years, which had been very marked in the direction of smaller farms. Thus in 1860 the average size of American farms was 199 acres, in 1870 it was 153 acres, and in 1880 it was down to 134 acres, but in 1890 the average farm contained 137 acres.

We print below a summary by groups of States of the number of farms of the different sizes in 1890 compared to 1880, with the total and percentage increase or decrease. This is the first publication of these facts from the Eleventh Census. Their meaning will be interpreted in connection with their bearing upon the question of farm ownership, farm tenantry and farm mortgages, in an exhaustive review of these and other original census returns, by Herbert Myrick, in the AMERICAN AGRICULTURIST for April.

GROUPS OF STATES.	*North Atlantic.*	*South Atlantic.*	*North Central.*	*South Central.*	*Western States.*	*United States.*
Number of farms, total, 1890	658,569	749,600	1,923,822	1,086,772	145,878	4,564,641
Ditto in 1880	696,139	644,429	1,697,968	886,648	83,723	4,008,907
Increase (+) or decrease (—)	—37,570	+105,171	+225,854	+200,124	+62,155	+555,734
Percentage inc. or dec.	—5.39	+16.32	+13.30	+22.57	+74.24	+13.86
Under ten acres in size, No., 1890	38,425	38,821	36,269	31,235	5,444	150,194
Ditto, 1880	42,221	32,570	33,661	27,110	3,679	139,241
Increase or decrease of No.	—3,796	+6,251	+2,608	+4,125	+1,765	+10,953
Percentage inc. or dec.	—8.99	+19.19	+7.74	+15.21	+47.97	+7.86
Ten and under 20 acres, 1890	49,036	63,727	51,984	93,818	6,985	265,550
Ditto, 1880	52,578	53,977	53,550	90,322	4,320	254,749
Increase or decrease, No.	—3,542	+9,550	—1,566	+3,496	+2,665	+10,801
Percentage inc. or dec.	—6.73	+17.69	—2.92	+3.87	+61.38	+4.23
Twenty and under 50 acres, 1890	117,214	189,431	297,511	282,933	15,688	902,777
Ditto, 1880	125,834	140,924	295,486	269,596	9,734	781,574
Increase or decrease	—8,620	48,507	+2,025	+73,337	+5,954	+121,203
Percentage inc. or dec.	—6.85	+34.42	+6.85	+34.98	+61.16	+15.50
Fifty and under 100 acres, 1890	195,364	151,889	526,935	232,497	14,800	1,121,485
Ditto, 1880	203,168	124,583	509,160	185,729	10,172	1,032,810
Increase or decrease	—7,804	+27,306	+17,775	+46,768	+4,728	+88,675
Percentage inc. or dec.	—3.84	+21.11	+3.49	+25.12	+46.48	+8.58
100 *and under* 500 *acres*, 1890	254,510	275,366	983,218	407,328	87,672	2,008,694
Ditto, 1880	267,218	257,610	787,512	336,362	47,291	1,695,983
Increase or decrease	—12,708	+18,356	+195,706	+70,966	+40,381	+312,711
Percentage inc. or dec.	—4.75	+7.12	+24.85	+21.09	+85.38	+18.43
500 *and under* 1,000, 1890	3,287	21,736	23,437	26,666	9,269	84,395
Ditto, 1880	4,156	25,037	15,628	25,872	5,299	75,972
Increase or decrease	—869	—3,301	+7,809	+794	+3,970	+8,423
Percentage inc. or dec.	—20.90	—13.10	+49.96	+3.06	+74.91	+11.08
1,000 *acres and over*, 1890	733	8,030	4,468	12,295	6,020	31,546
Ditto, 1880	964	9,718	2,990	11,659	3,247	28,578
Increase or decrease	—231	—1,688	+1,478	+636	+2,773	+2,968
Percentage inc. or dec.	—23.96	—17.36	+49.43	+5.45	+85.40	+10.38
Average size of farms, 1890	95.0	134.0	133.0	144.	324.	137.
Ditto, 1880	97.6	157.3	121.9	150.	312.	134.
Increase (+) or decrease (—)	—2.6	—23.3	+11.1	—6.	+11.2	+3.
Percentage inc. and dec.	—2.6	—14.8	+9.1	—4.0	+3.5	+2.2

Reports of Agricultural Experiments.—Most farmers and other busy men have neither the time nor the inclination to study carefully the detailed reports of scientific experiments, even when the latter closely concern them. Unless the report is very technical, giving every detail, the reader must rely upon the judgment of the scientist, and in every case the accuracy of the research must be admitted before any weight can be given to the results. The average non-technical reader is interested in brief, popular summaries of experiments, if he can rely upon the ability of the scientist. The South Carolina experiment station now prints a popular summary of each bulletin as its first pages. Then follows the technical detailed report of the research, which should be published that the work may be criticised and the results verified by others. A large edition of those pages containing only the popular summary is widely distributed, and supplies to farmers all that most of them wish to know, while the complete bulletin is sent to all who apply for it, and to the newspapers and the other stations. This plan permits the detailed report to be as technical as is necessary, a feature which is conspicuously absent in many station bulletins, and at the same time, makes the results at once acceptable and useful to practical agriculture.

The Farmer and the Tariff.—The legislative committee of the National Grange of the Patrons of Husbandry, in a petition to congress, emphatically object to some of the changes proposed in the agricultural schedule of the proposed tariff bill. When the people decided for the protective policy at the polls, the Grange asked congress that, in the protective tariff revision, agriculture should receive the same consideration as did other interests. The farmer's demands were respectfully and fully considered, and, with one exception, all that the Grange asked was incorporated in the law, and the farmers were largely incidentally protected in the American markets, and as a result realized better prices for hay, barley, vegetables, potatoes, beans, live stock, poultry, eggs, tobacco, fruits, and many other products, which were not oppressive to those engaged in other vocations. The committee believe that the proposed bill is not in strict conformity with the last decision of the people at the polls, and is very unjust in so far as it pertains to the farmers, as it unfairly discriminates against

(*Continued on Page* 164.)

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and the abscess had already begun to discharge less freely. I felt stronger and had a terrible appetite. Previous to this I had given up to die. When I had taken the second bottle I was able to sit up and accordingly I was not taken to the hospital and the final operation was deferred. Now I have taken six bottles and the abscess has entirely healed. I am well and go everywhere. My friends think it is a miracle to have me restored to them again so healthy and even younger in looks than before my sickness.

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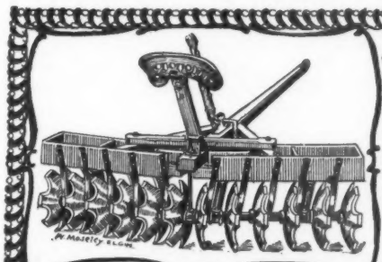

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$1.00 PER POUND— Either RED WETHERSFIELD or YELLOW DANVERS.

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In lots of FIVE POUNDS of one kind or assorted as desired. With every $5.00 order goes FREE a copy of **Greiner's Newest and Best Book, "ONIONS FOR PROFIT,"** telling all the Secrets of Success in Old and New ONION CULTURE.

If You Garden for Profit

you can save money and should buy at **Wholesale Prices,** as quoted in **BURPEE'S BLUE LIST for 1894.** It is mailed FREE to Market Gardeners everywhere, who, while entitled to *the lowest prices possible,* should always be sure to get **Only the Best Seeds That Grow! BURPEE'S SEEDS ARE WARRANTED,**— *few equal, none better*—and are annually sold direct to many more planters than are the seeds of any other growers.

W. Atlee Burpee & Co., Seed Growers, Philadelphia, Pa.

☞ If you have not already seen **BURPEE'S FARM ANNUAL for 1894,** write for it **TO-DAY.** A handsome book of 172 pages, it is pronounced by papers everywhere *The Leading American Seed Catalogue.* It tells all about the Choicest Vegetables and Most Beautiful Flowers for THE HOME GARDEN.

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are always **THE BEST.** Grown from pedigree seed in the new lands of the cold North-East, they yield Earliest and largest crops in every climate.

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produce earlier vegetables than any other on earth.

MY NEW ILLUSTRATED CATALOGUE MAILED FREE. Address

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Starr, the largest early apple; **Paragon,** and other valuable sorts. **Lincoln Coreless, Seneca** and **Japan Golden Russet** Pears in collections at reduced rates. **NUTS**—Parry's **Giant, Pedigree Mammoth, Paragon** and other chestnuts. **Walnuts**—French, Persian, Japan, English and American. Pecans, Almonds and Filberts. **Eleagnus Longipes, Hardy Oranges, Dwarf Rocky Mt. Cherries** free from insects, black knots or other diseases. **Small Fruits, Grapevines, Currants, Etc. SHADE TREES**—Immense stock of **Poplars** and **Maples, Ornamental Shrubs** and **Vines.**

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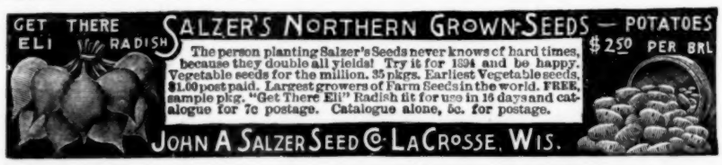
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"THEY HAVE NO EQUAL," says E. S. CARMAN, R. N. Y., and H. E. VANDEMAN, U. S. Dept. | A full assortment of **FRUIT TREES,**

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OUR BIG **6** **Free STRAWBERRIES** given away **FREE.** We are introducing six of the finest strawberries ever offered. This is what *Rural New-Yorker* says of one, **Rio, as a first early** berry: "This is well worthy of trial because of its **size, shape, quality** and **color.** The quality is excellent. We know of no better quality in so **early a berry.**" 100 other varieties. Send for information and our catalogue and get *one dozen* or 100 Strawberry plants *Free.*

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Better than Ever for 1894.

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"There is no Seedsman in America that enjoys a sounder reputation for square dealing and conscientious claims for the seed he offers. His Catalogue makes no pretense of captivating by tawdry colored pictures, or inflated windy phraseology. It aims to guide, not to bewilder, its readers."
—(*From Editorial in Rural New Yorker.*)

To all in search of this kind of a Vegetable and Flower Seed Catalogue, we shall be happy to send it free. You will find in it, probably, a larger variety of some kinds of Vegetable Seed than is in any Catalogue published in this country or Europe; many of the more costly we raise on our four seed farms. There are pages of Novelties, from which the humbug has been winnowed out.

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This excellent variety is distinguished from all others by its large stiff stalks, as shown in the engraving, standing up like a tree without support of any kind. It bears **abundantly** of large, bright red tomatoes, **very smooth** and of **fine flavor;** it is **extremely early** and entirely free from rot; the leaves are very curly and of a dark green color, almost black, making the plant very ornamental in appearance as well as useful.

THE MANSFIELD TOMATO

A mammoth variety, growing from 6 to 10 feet in height. The fruit is of large size and excellent quality.

FINCH'S EVERGREEN CUCUMBER

A very handsome variety of **superior quality,** firm and crisp, of a dark green color, growing from 10 to 12 inches **in length, and immensely productive.**

GENUINE SUREHEAD CABBAGE

Is all head and always **sure to head.** Very uniform in size, firm and fine in texture, **excellent in quality,** and a remarkable **good keeper.** Alfred Rose, of Penn Yan, N. Y., grew a head which weighed **64 1-2 pounds.**

FINCH'S PERFECTION LETTUCE

The **finest variety** in the world. Does not head like some varieties, but forms **huge, compact bush-like plants** which are always very **crisp and tender.**

☞ I will send a packet each of Finch's Tree Tomato, Mansfield Tomato, Evergreen Cucumber, Sure-head Cabbage and Perfection Lettuce; also **7 Valuable Secrets,** one of which cost **$300** to obtain. All by mail, postpaid, for only **25 cents in Silver, or 3 ten-cent stamps.**

FIVE CINNAMON VINES FREE

This rapid growing Vine, with its beautiful heart-shaped leaves, glossy green peculiar foliage, and delicate white blossoms, emitting a delicious cinnamon fragrance, will grow from **10** to **30** feet in a **single season,** and for covering Arbors, Screens or Verandas is without a rival. I will send **5 BULBS FREE,** and postpaid, to every person sending me **25 cents** for the above **Tree Tomato Collection.** The bulbs will produce **5 Beautiful Vines,** exactly the same in every respect as I have been selling for **One Dollar.** Address plainly

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Frank Finch is perfectly reliable and trustworthy.—Ed. Ex.

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A **Complete Catalogue** of all **Standard varieties** and the **new things** of merit mailed free to all interested in **Flowers, Gardening or Farming.** You will **not** be disappointed in the **purity** or **vitality** of **our Seeds.**

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A Most Remarkable Grape

Each year's test demonstrated more fully the superiority of the Green Mountain Grape over all others for earliness and fine quality. We are the introducers and are headquarters for this most valuable of all early grapes. Every vine sealed with our trade mark name GREEN MOUNTAIN. Send for free circular giving full information. Agents wanted.

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Comprising all of the Really Distinct Varieties of these charming garden flowers, selected by careful comparison from our trials of nearly one hundred varieties—

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"Emily Henderson"

THE QUEEN OF WHITE SWEET PEAS.

A gloriously beautiful acquisition of American origin. **Absolutely pure white,** as clear as alabaster and as lustrous as satin. The flowers, of **remarkable substance,** are borne on long stiff stems, **are extra large,** with broad round standards that stand up boldly without reflex or curl.

The plants are robust, compact and branching, producing such a prodigal abundance of flowers that the plants appear as if covered with snow. From one plant, specially cultivated, we have cut in one season the seemingly incredible number of 1,033 **sprays** of bloom! **In earliness** it outrivals all competitors by nearly two weeks, and continues a veritable "cut-and-come-again" to the end of Autumn.

Pkt., 15c.

Butterfly. White, suffused lavender; edged with blue, *Pkt.* 10
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Queen of the Isles. Striped, rose, crimson, wine red and white..... 10
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Dorothy Tennant. Heliotrope; beautiful.. 10
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Her Majesty. Deep rosy crimson..... 10
Emily Henderson. (see cut)..... 15
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$1.85

Any of the above free by mail on receipt of price or entire collection for **$1.00** (total value $1.85.) Buyers of one or more packets will be sent 1894 catalogue free if they will name paper and date of issue.

On receipt of **$1.00** we will mail, free, **ALL SIXTEEN VARIETIES** of Sweet Peas named in right hand column (including the Emily Henderson), and in addition, will send without extra charge, **with every order** from this advertisement, providing you will name this paper and date of issue, **Our Grand 1894 Catalogue of "EVERYTHING FOR THE GARDEN,"** (value 20c.) larger and more beautiful than ever, 160 pages, six colored plates and nearly 500 engravings, replete with all that is desirable, old and new, in **Seeds, Plants, Bulbs, Tools, &c.**

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What a wonderful thing is **a live seed.** Immature, old or dead it may *look* the same. How to know? Old gardeners say that

Burpee's seeds grow.

This is the proof of life. When grown we give our word you will be satisfied—your success is ours. **BURPEE'S FARM ANNUAL** for **1894,** 172 *pages,* tells all about *the Best Seeds that Grow.* The newspapers call it *the Leading American Seed Catalogue.* Yours *free* for the asking if you plant seeds.

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A BARGAIN Collection of Flower Seeds

10 Choice Annuals (everybody's favorites), all new fresh seeds, sure to grow and bloom this season. Pansy, 40 colors and markings; Phlox, 10 colors; Verbenas, 15 colors; Pinks, 10 colors; Petunia, 10 colors; Asters, 12 colors; Balsam, 8 colors; Mignonette Sweet mixed, Sweet Peas, 12 colors and Sweet Alyssum.

FOR 12 CENTS and the name and address of two of your friends who grow flowers, I will send, post-paid, the complete collection, one pkt. each of the ten varieties (enough for any ordinary garden.) This is a **BONAFIDE** offer, made to introduce my home grown flower seeds to new customers and which I guarantee to please you or the amount paid refunded, and the seeds given as a present.

Address, **Miss C. H. LIPPINCOTT,**
310 and 323 Sixth Street, South, MINNEAPOLIS, MINN.

BUY YOUR SEEDS FROM THE GROWERS. FARMER SEED CO. CHICAGO.

SEEDS

For the **Farm, Field and Garden.** Buy direct from the growers, and secure the Best Seeds at Lowest Prices. Every Farmer and Dairyman interested in

Permanent Pastures

and **Meadows** should send for our Catalogue or Book on "Permanent Pastures and Meadows." We send it free to you. It contains accurate and true descriptions of our natural Grasses and Clovers and Clover-Grass Mixtures adapted for different soils for *permanent* Meadow or Pasture, as well as descriptions and prices of a large stock of Seed Oats, Wheat, Barley, and Seed Potatoes; also Garden Seeds. 13 sample packages of either Grass or Grain, by mail, for only 10 cents.

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GREENHOUSE AND HARDY PLANTS
ROSES, BULBS
SMALL FRUITS SEED POTATOES
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WARRANTED. Best in the World.

By mail, postage paid, **1 cent** a package and up. Grand lot of EXTRAS given with every order. Prettiest and only FREE Catalogue in the world with pictures of all varieties. Send yours and neighbors' address.

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ROCKFORD, - ILLINOIS.

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For Your { TREES, SHRUBS, VINES and SMALL FRUITS.

Descriptive Illustrated Catalogue **Free.**

THE WM. H. MOON CO.,
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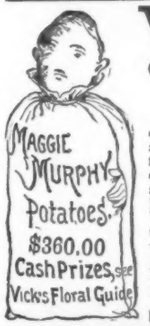

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Contains 112 pages 8 x 10 1-2 inches, with descriptions that describe, not mislead; illustrations that instruct, not exaggerate.

The cover is charming in harmonious blending of water color prints in green and white, with a gold background,—a dream of beauty. 32 pages of Novelties printed in 8 different colors. All the leading novelties and the best of the old varieties. These hard times you cannot afford to run any risk. Buy **HONEST GOODS** where you will receive **FULL MEASURE.** It is not necessary to advertise that Vicks' seeds grow, this is known the world over, and also that the harvest pays. A very little spent for proper seed will save grocer's and doctor's bills. Many concede Vick's Floral Guide the handsomest catalogue for 1894. If you love a fine garden send address now, with 10 cents, which may be deducted from first order.

NOVELTIES.

Branching Aster, (Often sold for Chrysanthemum.)
Hibiscus, Sunset,
Dahlia, Ethel Vick,
Large Morning Glories,
Double Anemone,
Charmer Pea,
Maggie Murphy and other Potatoes.

ROCHESTER, N.Y. JAMES VICK'S SONS.

Choice Flower Seeds.

Grown and sold by **MILTON E. FISK, Lunenburg, Mass.** Send for catalogue and receive sample pkge. free.

TOPICS OF THE TIMES.

(*Continued from Page 160.*)

the interests of agriculture by virtually abandoning the New England, New York, and coast trade to Canada and other foreign countries, by reason of proximity and cheap water transportation, which in effect bring the producers in foreign countries closer to these markets than the United States farmers in the interior, who must transport by the more costly methods of rail. The great bulk of agricultural products imported into the United States from Canada and from Europe are consumed in our seaboard cities and great manufacturing centers, which should be preserved as a market for the products of the farmers of the United States. The committees believe that the difference in the cost of agricultural productions in the United States and in foreign countries should be regarded as a just measure of the duties which may be laid upon the products of foreign agriculture for the protection of American farmers. The farmer produces wool, flax and other fibers, and if the manufacturers should have free wool, then the farmer should have free cloth. The Grange asks only for justice, that the farmer be treated as others are treated.

No Contagious Pleuro-Pneumonia.—The most satisfactory evidence and conclusive testimony that the United States has been entirely free from the contagious pleuro-pneumonia of cattle for two years was presented to the recent American Veterinary Congress at Chicago, which in consequence resolved to ask of Great Britain the entire removal of the quarantine regulations applying to contagious pleuro-pneumonia in the United States. Inasmuch as the Canadian Department of Agriculture has clearly demonstrated that this dread disease does not exist in Canada, the congress resolved that the quarantine of the United States against Canadian cattle is unnecessary and should be removed, and Canada was asked to give similar consideration in regard to the freedom of the stock trade between Canada and the United States.

Protests Against Secretary Morton's Views on the farmers' needs and opportunities, as set forth on Pages 708-9 of the AMERICAN AGRICULTURIST for December, reach us in every mail. This shows that among our readers, as among the rural readers of other journals, there is a widespread belief in the necessities of comprehensive organization, and also in the value of practical co-operation in buying and selling, as well as in political, social, and educational matters. Many of Mr. Morton's critics approve what he says about the necessity for individual thinking, individual investigation, and individual effort on the part of the farmer in his own business, but they do not agree with him that this development of the individual is by any means sacrificed when he joins the grange or other farmers' organization. The trouble seems to have been that Mr. Morton, by his extreme views, has aroused equally extreme antagonism among those who do not subscribe to his tenets. The AMERICAN AGRICULTURIST'S judgment is that each farmer and every member of his family should do their very best, not only in their own business as farmers, but in the social, religious, and practical life of the community in which they live. This necessarily involves organization and co-operation, of which we are to have more in the future than we have had in the past.

SEEDS! SEEDS!

My Annual PRICED CATALOGUE is now ready and mailed free to all applicants. It contains all the leading and most popular sorts of

Vegetable, Farm and Flower Seeds

Besides all the desirable novelties of last season, and nearly everything else in my line of business.

ALFRED BRIDGEMAN,

37 East 19th Street, New York City.

NEW CROP ONION SEED

90 Cents per lb., Postpaid.

Either Red Wethersfield, Extra Early Red, Yellow Globe Danvers, or Yellow Dutch. Ten pounds or over of one kind, or assorted as desired. 80 cents per lb. by express, not prepaid. All warranted best seed. I annualy supply hundreds of market gardeners in 10 to 200 lb. lots. Order at once. Catalogue of bargains free. **F. B. MILLS,** Seed Grower, Box 203, **Rose Hill, N. Y.**

HIGH BRED Second crop round potatoes, 1 barrel worth two of Northern Seed, 500,000 Berry plants true, 50,000 Asparagus, eggs etc. Write for free catalogue. **J. W. HALL,** Marion Station, Md.

Our Great Catalogue for 1894

Is an elegantly illustrated book of 200 pages, composed of three distinct Catalogues bound together—one each of

SEEDS,—BULBS AND PLANTS,—NURSERY STOCK.

A work of unexcelled beauty and merit, rewritten and reconstructed in every particular. Every cut new, every line fresh. Printed on fine paper and in lovely bronze violet and brown colors. Many charming colored plates. Nothing like it ever before seen. We offer new and special strains of Flower and Vegetable seeds, all the standard new and rare Plants and Bulbs of every kind. Millions of Gladiolus, choicest Shrubs, Trees, Vines; also new and rare Fruits—some wonderful introductions from Japan. The greatest collection of rare things for the garden ever presented, and all at moderate prices. Do not fail to see this wonderful book catalogue. Sent, post-paid, for 25 cents, with check for valuable new Pansy seed gratis; or sent FREE to those who order the Jewel Rose.

CHILDS' JEWEL, the ROSE of Many Colors.

The greatest sensation among novelties. A perfect ever-blooming Rose, which bears at the same time flowers of several different colors—pink, yellow, buff, crimson—also variegated, mottled, striped and blotched. Flowers large and perfect and exceedingly fragrant. Petals large and silky. Buds exquisite. A free and constant bloomer. It is the most charming and wonderful Rose in cultivation; and a plant bearing 10 to 20 flowers, each of a different color or variegation, is a most exquisite sight and creates wild enthusiasm wherever seen. Strong plants for immediate blooming, by mail, post-paid, **30 cents each, 2 for 50 cents, 5 for $1.00, 12 for $2.00.**

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JOHN LEWIS CHILDS, Floral Park, N. Y.

CHARMING FLOWERS!

HOME GROWN
HONEST
RELIABLE

NEW
RARE AND
BEAUTIFUL

HOWARD'S ROYAL SPLENDOR VERBENAS.

This strain is the result of over **twenty years careful selection.** The trusses of bloom and individual flowers are of the **largest size** with wonderful range and **dazzling brilliancy** of colors. Choice mixed colors, per packet 25 cents.

EVIDENCE OF QUALITY. C. B. Willard, Oswego Falls, says: "I tried your Royal Splendor Verbenas last year and never had as many nice plants or such beautiful flowers from a package of seed. I had tried all the leading seedmen. The colors were gorgeous and such a variety."

HOWARD'S IMPROVED LILLIPUT ZINNIA.

This new small-flowered variety is a perfect treasure. Dwarf, compact, bushy plants, bearing very small, perfectly double flowers of the most brilliant and varied colors; orange, crimson, pink, yellow, violet, scarlet, white, etc. Everyone who loves flowers should give this improved strain of Zinnias a trial. Choice mixed colors, per packet 10 cents.

EVIDENCE OF QUALITY: William Falconer, Glen Cove, N. Y., says: "Your Lilliput Zinnias are superb; the finest I have ever grown."

SPECIAL OFFER.

To all ordering at once and sending **35 cents** for the Verbena and Zinnia Seed, I will send **free** a packet of **Henderson's Curled and Crested Zinnia.** Or a packet of **Comet Asters,** mixed colors, if preferred. Address, mentioning **this paper,**

A. B. Howard, Seed Grower, Belchertown, Mass.

Underfeeding Ohio Sheep.

It often happens that from our failures we learn our best lessons, lessons that stamp themselves so indelibly upon our memory that we will always remember them. A few stern lessons upon the dark side of sheep husbandry, will never be forgotten by me. When commencing farming for myself I had a small flock of sheep from which I made money, but buying a piece of timber land and commencing to clear, I was told by old farmers that my best plan would be to keep enough sheep to keep all sprouts and briers down. By buying and keeping my increase I soon had a flock of forty-two head of sheep, and by keeping them almost exclusively upon wild pasture without grain or other feed, of course they kept it clean. But as a yearly dividend I received from thirty-three ewes bred, thirteen lambs and a very poor clip of wool. The next year I bred thirty-two ewes to a mongrel bred ram. The flock went into winter quarters in very low flesh, and being overstocked, their feed allowance was, of course, low. Out of fifty-five sheep wintered lost ten, and from thirty-two ewes bred succeeded in bringing to maturity only seven lambs. What a time we had of it! Ewes poor, no milk, bad weather, poor shelter, poor feed, and, above all, not enough of it; ewes dying, lambs dying at every turn, and almost every one disowned by its dam. I believed then more in luck than I now do; and thought that if there was ever an unlucky person it was I. But it now looks as if it was all my own fault. Feed makes the breed and it makes money also. I now see the sunny side of sheep husbandry, and am well pleased with the outlook.

C. R. WAGNER, Hancock Co., Ohio.

FRUIT TREES

PLANTS, VINES, ETC.

Our **1894 Catalogue** is the **most complete** book ever issued in the interests of the Fruit grower. **72 pages of valuable information** about the **choicest varieties of Fruit Trees, Plants and Vines.** We send it *Free.*

T. J. DWYER, CORNWALL, N. Y.

The sower has no second chance. If you would at first succeed, be sure and start with

FERRY'S SEEDS.

Ferry's Seed Annual for 1894 contains the sum and substance of the latest farming knowledge. Every planter should have it. Sent free.

D. M. Ferry & Co., Detroit, Mich.

SEEDS GIVEN AWAY

FOR TRIAL. I have found that the best way to advertise good Seeds is to give away a sample for trial. If you will send me a 2-cent stamp to pay postage, I will mail free one package, your selection, of either Cabbage, Carrot, Celery, Cucumber, Lettuce, Musk or Water Melon, Onion, Parsnip, Pepper, Pumpkin, Radish, Spinach, Squash, Tomato, Turnip, or of Flower Seeds—Aster, Balsam, Celosia, Carnation, Mignonette, Pansy, Phlox, Poppy, Sweet Peas, Zinnia, or Verbena, and one of my 1894 Catalogues. Under any circumstances do not buy your Seeds until you see it, for I can save you money. Over 200,000 people say my seeds are the cheapest and best. I have earliest vegetables on record. Discount and large prices to agents. 50 cents worth of Seeds free with $1.00 order Write to-day. **F. B. MILLS, Box 15, Rose Hill, N. Y.**

EVERGREENS.

Largest stock in America, including **Colorado Blue Spruce and Douglas Spruce of Colorado.**

Also *Ornamental, Shade and Forest Trees, Tree Seeds, Etc.*

R. DOUGLAS & SONS, Waukegan, Ill.

More New Creameries

THAN ALL OF OUR COMPETITORS COMBINED.

THE U. S. CREAM SEPARATOR

Was the Last to Come on to the Market. It now

STANDS AT THE HEAD.

Our Competitors had the Field when we entered it. This year we have put in **MORE NEW PLANTS** in the VERMONT DISTRICT, including **VERMONT AND NEW HAMPSHIRE,** than ALL OF OUR COMPETITORS COMBINED. The largest creamery in the country is located in this district. It is furnished with competitors' machines, and they had it to refer to and to take prospective purchasers to visit, but said prospective purchasers, after thorough investigation and tests, selected the

U. S. SEPARATORS.

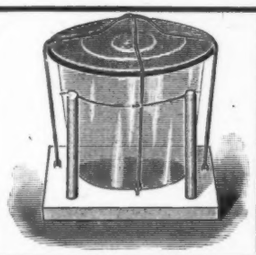
This must be convincing to every thoughtful person that the U. S. SEPARATOR has

MERITS SUPERIOR TO ALL OTHERS.

If you are contemplating purchasing **CREAM SEPARATORS** please give us an opportunity to prove to you all we claim. You CANNOT AFFORD to use any other than the **U. S. SEPARATOR** when you consult your best interests. Also remember it was awarded **Medal** and **Diploma** of Highest Merit at **World's Fair, Chicago.**

MADE IN THREE DAIRY AND TWO FACTORY SIZES.

Vermont Farm Machine Co., Bellows Falls, Vermont.



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ANIMAL AILMENTS.

Harness Galls.—D. T. Burr, Vernon Co., Wis. A good rule in choosing a horse collar is to hold the horse's head up to its natural position at work or in traveling, so that the hand can be passed readily through at the bottom. If too short, the shoulders will be galled or the horse choked. If too large, the breast will be galled or the shoulders lamed. Dirty harness, and especially accumulations of sweat and dirt, are the most frequent cause of painful galls, which become great raw ulcers. The proper time to clean the harness is when it has been removed after work and when it can be readily washed or scraped clean with a smooth, dull knife. This will save time and great suffering to the poor, faithful animal. A properly fitting harness and a clean, sound skin will enable a horse to do more work with less trouble. The pain inflicted upon a galled horse is an unnecessary cruelty. No humane farmer or person should ever tolerate such torture to his horse or ox.

Shelter Cows in Calf.—Joseph Barker, Ontario Co., N. Y., asks advice about the best method of making and keeping his herd of dairy cows healthy and hardy during gestation. Do not milk them too long; give plenty of pure water and a reasonable variety of food with a daily feed of roots. They should have outdoor exercise daily when the weather is fairly good. Do not let the cows shiver outdoors or indoors from cold, but keep them indoors during extreme cold, and in rain or snow storms; fasten the cows with a chain around the neck in the stable so that they can have enough freedom of their heads to lick themselves. For a month before calving give soft foods and hay, because too high feeding is more harmful than too low feeding, the happy medium being best; but remember that both mother and fœtus must be nourished. Some men keep their cows in the stable during the whole winter, but have ample room, good air, clean stables, and good care and liberal feeding, and there are no more healthy, thrifty or productive herds. It is profitable to shelter and liberally feed dairy stock.

Rye for Breeding Animals.—J. Bull, Mitchell Co., Kan.: Both rye and rye grass sometimes exert unfavorable influences upon pregnant cows. Rye affected with ergot has been known to have produced abortion. Ripe, unthrashed rye has been known to have excited a troublesome cough in cattle and horses, from the production of irritation of the bronchial mucous membranes. And even the best marketable rye contains too much ergot or spurred rye to make it safe food for breeding cows or mares. Rye grass produces the same kind of irritation and cough. This may be overcome as a fodder, by cutting and moistening with water, or fresh brewers' grains. This latter makes a valuable combined fodder for both cattle and horses if used when fresh and sweet.

Ewes Bitten by Dogs.—P. Doty, Suffolk Co., N. Y., has had several ewes bitten by dogs. The wounds were cauterized with carbolic acid. After lambing the lambs died. The shock from fright, and the pain and suffering interfered with the process of gestation, thus producing feebleness, which often causes premature birth. This, rather than the carbolic acid, caused the death of the lambs. Sheep are especially sensitive to pain, privation, and neglect. They are equally susceptible to care and favoring circumstances, and these always prove beneficial.

Blistering Horses.—Theodore Gayson, Gonder Co., Nevada, resides in a section where there are no veterinarians, and wishes to know how to blister safely the fore leg of a horse. From his letter we cannot judge of the necessity to blister, and can, therefore, only give the proper method. Blisters produce active inflammation of the skin to which they are applied, to relieve a deeper disease, on the principle of counter-irritation. When a blister rises promptly after application, it denotes thin skin and a favorable result. But when in enfeebled animals, from long standing and debilitating disease, its non-action may be a premonition that the case is likely to terminate fatally. To make a liquid blister, take a pint of olive oil, an ounce of powdered cantharides; mix them in a bowl standing in hot water, with frequent stirring for two hours. Set aside till cool, and add half a pint of spirits of turpentine. Cover closely and next day warm over hot water, and when quite warm strain through muslin into a large mouthed bottle, into which two fluid ounces of oil of origanum had been previously poured. To apply, cut the hair short and smear around the part to be blistered, a coating of wax or paraffin, to prevent the blister from extending, and then thoroughly apply the blister on a closely-wrapped swab in very small quantities, rubbing well, morning, noon, and evening till vesicles appear. Tie up the head of the horse to prevent licking or biting. Dress with melted lard or with vaselin, and watch the result for a few weeks, or until recovery.

Horse Bots.—A. C. Marshall, Marin Co., Cal.: The bot is the larva of two kinds of the gadfly *Gasterophilus equi*. They obtain access to the stomach by means of the horse licking or biting the posts covered with the nits or eggs. They remain in the stomach six or eight months, and pass from the body to the ground, where they mature and emerge as the gadfly. Some authorities advise powerful cathartics, as aloes and croton oil, or spirits of turpentine in two ounce doses in a pint of gruel, followed by iron tonics. But when the bots cause irritation, potato juice is good, gruels and liquids to feed the bots, adding small doses of tincture of opium to remove irritation. A pint of linseed oil in summer when the bots are coming away, will expedite their expulsion.

Ringworm in Cattle.—K. H. Norcross, Grant Co., Minn.: Ringworm is common in cattle, and especially in dairy cows. Wash the part with baking soda and hot water, and then apply strong acetic acid with a camel's hair pencil three times a day, or use an ointment made with a dram of iodine to an ounce of lard. This should be applied by rubbing it in with the point of the finger, which will generally cure in a few days.

Non-Breeding Animals.—C. K. Mason, Venango Co., Penn.: Barrenness in domestic animals is a serious embarassment to the raising of pure bred stock. Though all the breeds are liable to this malady, the beef or meet producing animals are most subject to the evil. In the meat producing breeds excessive tendency to fatten is one of the most frequent causes of sterility. Low diet and useful work are means of prevention or needful remedy of value. A most useful method in the prevention of sterility is early and persistent breeding. Mares are more subject to this trouble from not breeding them early, and from not continuing to breed them. A fine road, racing, or trotting mare is too often worn out before being put to breeding. Then when her powers rapidly fail, the desire for another animal like her comes, and alas, too late, as she will not get in foal.

White Scours in Calves.—Allen Syphert, Bucks Co., Pa., requests a remedy for white scours or serous diarrhea in young calves. For a calf three or four weeks old, four ounces of linseed oil, a teaspoonful of landanum, and a teaspoonful of essence of ginger, in a pint of warm new milk will remove offending material from the bowels, allay the irritation and restrain the discharges. The milk should be given warm, with a teaspoonful of bicarbonate of soda, and given slowly and in smaller quantities and three times a day. Half an ounce of tincture of catechu in the milk will be of service in restraining the diarrhea.

Abscess on Neck.—Albert Condie, Essex Co., Vt., has an ox that has a large swelling on the neck from a roughened yoke which was run over by a loaded wagon. It was not a scratch but seemed like a bruise. It is as large as a goose egg, and seems growing larger, and is becoming quite sore. It should have been treated early with tincture of iodine. Large bran poultices should be applied quite hot and covered with cotton or wool to keep the heat and moisture as long as may be. When cool remove to a stew-pan and add hot water and fresh poultice. As soon as a fluctuating feeling is imparted to the fingers by laying together the tips of the three fore-fingers of each hand, the fingers of each hand separated an inch from each other; then with an alternate pressure of each set of fingers, pressing firmly for a moment the fingers of one hand while the other is relaxed, if there is matter, even deep seated, there will be felt a flowing fluid under the fingers. As the natural tendency of matter is to the surface, where the pus is deep further poulticing may be advisable. But as the skin on the neck of a working ox is thick, an early opening will be necessary. Let the cut be lengthwise of the neck, and firmly grasp the blade of a sharp pointed knife between the thumb and finger as far as it is desired to protrude, and firmly and forcibly push the blade into the abscess where it will reach the matter. The ox being securely tied, and the wrist of the hand holding the knife firmly resting upon the neck, the puncture will be made as previously designed without wavering by the struggle of the ox. As a rule, in abscesses, the opening should be made at the lowest point where the matter is detected, as gravitation acts here as elsewhere. But where the base is hard, a free opening will secure the exit of matter if the opening is made at the top and reaches the pus. Thorough cleansing, and applying frequently new poultices will prove good treatment. Old and mattery poultices should be burned out of doors. When trying to prevent the formation of matter or pus by external application of tincture of iodine, a valuable internal aid will be sodium hyposulphite, two or three drams in the drinking water two or three times a day. The food should be mashes and silage or roots, with a fair supply of common salt.

Bots in Horses.—Cornelius Closky, Aiken Co., South Carolina, states that bots are common in the horses of that section, and desires a vermifuge that will remove them from the stomach of horses. There is no safe and efficient remedy that will remove bots from the horse. A preventive remedy is to keep the horses from pasture during the few weeks in which the bot fly deposits her eggs upon the hairs of the legs and sides reached by the mouth of the horse. The moisture from licking or biting the parts infested with the bot-eggs, aids their early hatching during the warm season, when the little maggots find their way to the horse's stomach. Rubbing and washing the parts infested with nits with strong carbolic soap suds, or washing the fore legs with a solution of carbolic acid, an ounce to a pint of water, will prevent the fly from depositing the eggs. Syringing the hair on the fore legs will prevent the depositing of nits by the bot fly. The destruction of the bots as they pass from the bowels will lessen the trouble.

Delicate Feeding Ewes.—Charles Fulmer, Beadle Co., South Dakota, has considerable trouble with his breeding ewes. Near lambing time they become delicate feeders. He would like to know some simple remedy that will improve their appetites. Make the following cordial: Powdered caraway seeds, five ounces; powdered ginger, five ounces; oil of cloves, two drams; molasses, one pint; warm linseed mucilage, six pints. Mix thoroughly and keep in a cool place, and give each ewe before feeding, a big iron spoonful (about an ounce or two tablespoonfuls). A half-pint of alcohol will keep it from souring. Put a teaspoonful of sulfate of iron in a pail of the drinking for six ewes, alternated with the same quantity of saltpeter dissolved in the same quantity of water twice a week.

Influenza in Sheep.—Conrad Havens, Saunders Co., Nebraska, has several sheep in his flock that cough and have acrid tears from the eyes and a running from the nose. This is a condition in the sheep akin to the grip in the human subject, and it, as in man, predisposes to pneumonia. Give a tablespoonful of the following mixtures of powders in molasses, by putting the stiff mixture on the back of the tongue twice a day, by means of a smooth piece of shingle: Powdered rhubarb, three ounces; muriate of ammonia, two ounces; saltpeter, three ounces; cream of tarter, four ounces; sulfur, three ounces—all finely powdered and mixed thoroughly. Keep the sick stabled by themselves. Feed oats with a little whole flaxseed and clean hay.

Mange in Pigs.—Samuel Jones, Okaloosa Co., La., has a fine litter of Chester white pigs with the sow that rub themselves continually. By careful search, a few small bare and sore spots can be seen on the hips and shoulders. The sow rubbed a good deal before farrowing the litter, and the trouble may have come from her. This is the burrowing mange parasite, and can easily be got rid of by scrubbing with soft soap suds, and then applying after each scrubbing, once a week, the following ointment, well rubbed into the sores: A pound of common turpentine melted with a pound and a half of lard; while still warm, add a pound of sulfur and an ounce of carbolic acid, mixing thoroughly. A bit of this ointment the size of a pea or chestnut will be sufficient.

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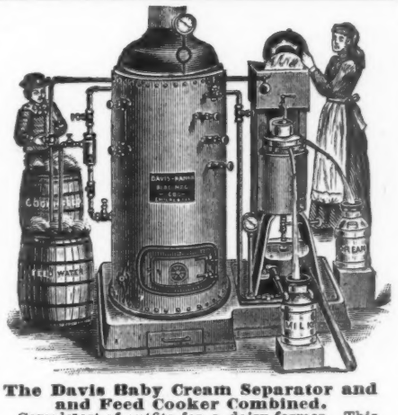

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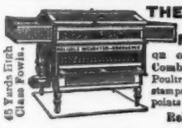

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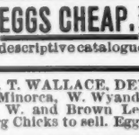

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This report is fully up to usual excellence and is to be consulted whenever a question arises concerning Kansas. Every phase of farming and farm interests is here statistically treated. The report on the Geology and Mineral Resources of Kansas by Robert Hay is especially complete. The Loco Weed is described by Prof. L. E. Sayre; the Kansas Salt Industry by Prof. E. H. S. Bailey; and Experiments for the Destruction of Chinch Bugs by Disease by Chancellor F. H. Snow of Kansas State University. There are a number of other excellent papers.

SUBURBAN AND COUNTRY HOMES. Containing designs for houses of moderate cost contributed by various architects, together with "Suggestions on House Building," by A. W. Cobb, architect, and "How to Plumb a Suburban House," by Leonard D. Hosford. New York: William T. Comstock, 1893. 45 full-page plates with letterpress, oblong quarto, cloth.

This artistic volume presents to intending builders and those interested in building a variety of designs for country houses of moderate cost. The plans shown are the work of nineteen architects, who have made a special study of the needs of suburban buildings. The many attractive towns adjacent to the great cities, illustrate the thought and skill that is now being bestowed upon suburban homes. The chapter on the plumbing of country houses is alone worth the price of the book. Sold by Orange Judd Company. Price, postpaid, $2.

INDIANA STATE BOARD OF AGRICULTURE. Forty-Second Annual Report. Including the Proceedings of the Annual Meeting, 1893; Reports of County and District Societies, State Meetings of Shorthorn Cattle Breeders, Dairy Association, Trotting and Pacing Horse Breeders, Swine Breeders, Wool Growers, Cane Growers, Poultry Association, Beekeepers' and Farmers' Institute. By Charles F. Kennedy, Secretary, Indianapolis, Ind. 1893. 579 pp., 8vo., cloth.

Indiana is preëminently an agricultural State, and in consequence this report is of great value. The statistical reports are instructive, and the papers are written by practical farmers, and consequently the details can be relied upon as correct, and the suggested improvement as feasible and necessary. The editorial and typographical work is excellent.

NEW YORK STATE DAIRY COMMISSIONER. Ninth Annual Report. By Josiah R. Brown. Albany: State Printing House. 898 pp., il., 8vo., cloth.

This report covers all phases of the dairy industry in New York State, special attention being paid to adulterated and imitation butter and cheese. The test of the various laws is given, and all the acts against oleomargarine, with the cases arising thereunder as tried in the courts. Very curiously the detection of adulterations and imitations of cider and other vinegar are included in the duties of the dairy commissioner. There is also a report of the investigations relating to the manufacture of cheese, which were conducted in coöperation with the agricultural experiment station at Geneva.

ADVANCED BEE CULTURE. Its Methods and Management. By W. Z. Hutchinson. Editor of the Bee-Keepers' Review, Flint, Mich. 88 pp., il., 8vo., paper.

This book is dedicated to those who are getting their bread and butter by raising honey to spread upon the bread and butter of mankind, and a very practical book it is. Every important point in bee-keeping is clearly explained, and the pleasing style and certain knowledge of the author can be judged from the many articles from his pen which have appeared in the AMERICAN AGRICULTURIST. Sold by Orange Judd Company, New York. Price, postpaid, fifty cents.

A PRACTICAL TREATISE ON GRAPE CULTURE. With Instructions how to Prune and Train the Vine on the Horizontal Arm System. By J. H. Tryon, Willoughby, Ohio, 1893. 27 pp., il., 8vo., pamphlet. Ten cents.

It has been but a few years since native American grapes have been an article of commerce in the large cities, where, now, the trade from August to January is enormous, and in small villages, where a few hundred pounds would formerly more than supply the demand, twice as many tons are now used. The United States now has a half million acres planted in grapes, and the growth of the industry has developed many improved methods of viticulture, which are described and explained in this volume.

THE SOUTH AFRICAN AGRICULTURIST'S ALMANAC for 1894. The Cape Farmers' Own Vade Mecum. By J. H. F. von Wurzburg-Schade. Wynberg: The Western Province Publishing Co. 1894.

This useful manual contains articles from specialists on all phases of South African farming. The treatment of sheep, horses and olives is especially complete. Sold by Orange Judd Company, New York. Price, postpaid, fifty cents. 256 pp., 12mo., paper.

POULTRY FOR PROFIT. By Major G. F. Morant. Author of "Poultry Keeping in Confinement." "Rabbits as a Food Supply," etc. With illustrations. London and New York: Frederick Wane & Co., 1893. 144 pp., il., 16 mo., boards.

This elegant little volume treats of poultry keeping from a British standpoint, and contains many useful hints for keeping poultry on small places. Sold by Orange Judd Company. Price, postpaid, fifty cents.

DOGS. A manual for amateurs. By Mrs. De Salis Author of "New Laid Eggs," "Faithful and True." London and New York: Longmans, Green & Co., 1893. 120 pp., 16 mo., half cloth.

This little book is written by a lover of dogs, and treats of the different breeds, and their uses and management. There are special chapters on diseases and accidents. Sold by Orange Judd Company. Price, postpaid, sixty cents.

THE CHEMISTRY AND TECHNOLOGY OF CHEESE-MAKING. By Dr. Ginseppe Sartori. Written in the Italian Language. Turin: Unione Tipografico Editrice. 1893. 279 pp. il.. 12mo., boards.

This treatise is published in the Italian language, and contains very full descriptions of the chemistry of cheese-making. The second volume will treat of practical cheese-making, with the most recent methods and appliances.

ENTERTAINMENTS. For Church Socials, Religious, Social and Charitable Organizations, Juvenile and Young People's Societies, and Home Entertainments. Published by Mrs. H. E. Kramer, Akron, Ohio, 1893. 90 pp., square, 12mo., paper.

This dainty little volume is as entertaining as the excellent diversions and amusements it describes. It is full of suggestions for those who are planning social gatherings.

Other Publications.

MISCELLANEOUS WORKS.

AGRICULTURAL SCIENCE. A Monthly Magazine. Edited by William Frear, Ph. D., State College, Penn., U. S. A. Especially Devoted to Agricultural Research. Octavo. $3 per year.

SUGAR PLANTING IN QUEENSLAND. The Under Secretary for Agriculture, Brisbane, Australia. Pamphlet.

WYOMING AS AN AGRICULTURAL STATE. Address on the Reclamation of the Arid Lands. Before the Cheyenne Chamber of Commerce. By Elwood Mead. Cheyenne, Wyoming. 1894. Pamphlet.

THE PROGRESS AND PRACTICAL VALUE OF AGRICULTURAL SCIENCE. An Address delivered by Dr. Peter Collier before the Pennsylvania State Board of Agriculture, Geneva, N. Y. 1893. Pamphlet.

HAITI. A Handbook. Being Bulletin No. 62 of the Bureau of the American Republics, Washington, D. C., U. S. A. 240 pp., ill., 8 vo., paper.

GEORGIA STATE HORTICULTURAL SOCIETY. Proceedings of the Eighteenth Annual Meeting. P. J. Berckmans, President. G. H. Miller, Secretary, Rome, Georgia. 85 pp., 8vo., paper.

COLEOPTEROUS LARVÆ with So-Called Dorsa Pro-Legs. By C. V. Riley, Washington, D. C.

BRITISH NATIONAL SHEEP BREEDERS' ASSOCIATION. Proceedings of the Second Annual General Meeting. Held at the Royal Agricultural Hall, London. W. W. Chapman, Secretary, Arundel St., Strand, London.

STATE LEGISLATION IN 1893. A Comparative Summary and Index. Library Bulletin, Legislation No. 4. Albany: University of the State of New York. 1894. 450 pp., 8vo., paper. Twenty cents.

MASSACHUSETTS HORTICULTURAL SOCIETY. Schedule of Prizes for 1894. Robert Manning, Secretary, Boston.

THE FEARFUL OUTLOOK on the Impending Crisis. To Whom it May Concern. Third Edition. By A. Stockam, Wait, Scioto Co., Ohio. Pamphlet.

MARYLAND LAND OFFICE. Report of the Commissioner, Philip D. Laird, Annapolis, Md.

THE OBSERVER. A Medium of Interchange of Observations for all Students and Lovers of Nature. Edited by E. F. Bigelow, Portland, Conn. Monthly. $1 per year.

AMERICAN ABERDEEN-ANGUS BREEDERS' ASSOCIATION. Proceedings of the Tenth Annual Meeting. Held at Chicago. Thomas McFarlane, Secretary, Harvey, Illinois.

GOOD ROADS. An Illustrated Monthly Magazine devoted to the Improvement of the Public Roads and Streets. Isaac B. Potter, Managing Editor. New York. $2 per year.

MINERALS AND COFFEE IN TROPICAL AMERICA. Monthly Bulletin. Bureau of the American Republics. Washington, D. C. Pamphlet.

MASSACHUSETTS. Transactions of the Worcester County Horticultural Society. Edward W. Lincoln, Sec'y. Worcester, Mass. 31 pp., 8vo., paper.

AMERICAN SHROPSHIRE SHEEP ASSOCIATION. Report of the Annual Meeting at Chicago. Mortimer Levering, Sec'y, LaFayette, Ind. 44 pp., 8vo., paper.

INCOME ACCOUNT OF RAILWAYS in the United States. Preliminary Report. Interstate Commerce Commission. Washington: Government. 1894.

WORLD'S COLUMBIAN EXPOSITION. Catalogue of the Russian Section. Published by the Imperial Russian Commission, Ministry of Finances. St. Petersburg. 1893. 572 pp., quarto, boards.

URUGUAY. A Handbook. Being Bulletin No. 61 of the Bureau of the American Republics. Washington, D. C., U. S. A. 347 pp., il., 8vo., boards.

NEW JERSEY GEOLOGICAL SURVEY. Annual Report for 1892. John C. Smok, State Geologist, Trenton, New Jersey. 367 pp., il., maps, 8vo., boards.

RHODE ISLAND STATE BOARD OF AGRICULTURE. Eighth Annual Report. Geo. A. Stockwell, Secretary. Providence, R. I. 420 pp., 8vo., il., cloth.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

ALABAMA—At Auburn. Vegetables (B. 51).

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A REVISION OF THE ADULT CESTODES OF CATTLE, SHEEP, AND ALLIED ANIMALS. 134 pp., 16 pls. (Bulletin No. 4, Bureau of Animal Industry.) A scientific classification and description of the different species of tapeworms found in cattle and allied animals.

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wholesale prices of farm products at leading cities of the United States; tables of agricultural exports and imports for 1892 and 1893; notes on foreign agriculture, including a brief review of the crops of Great Britain, France, Germany, Russia, Ontario, and Manitoba; notes from consular officers relating to crops in Scotland, Korea, Cuba, Cochin China, Germany, and Ontario; domestic and transatlantic freight rates.

STATE LAWS RELATING TO THE MANAGEMENT OF ROADS.—Enacted in 1888–93. 95 pp. (Bulletin No. 1, Office of Road Inquiry.) A compilation of abstracts of the most important of the recent State laws on the subject of roads, the essential portions of certain of these laws being given in full for reference.

RECENT FEATURES OF OUR FOREIGN TRADE. 24 pp. (Report No. 8, Misc. Series, Division of Statistics). A comparison of the annual exports and imports of the United States for the past three years, with a discussion of the fluctuations shown and their causes.

EXPERIMENT STATION RECORD, VOL. V., NO. 2. Pp. 139–268. Contents: A comprehensive article on farm manure, summarizing numerous investigations relating to its composition, fermentation, and methods of preparation; abstracts of publications of the agricultural experiment stations and of the U. S. Department of Agriculture; abstracts of reports of foreign investigations, etc.

EXPERIMENT STATION RECORD, VOL. V., NO. 3. Pp. 269–358. Contents: A condensed account of the seventh annual convention of the Association of American Agricultural Colleges and Experiment Stations; abstracts of publications of the agricultural experiment stations and of the U. S. Department of Agriculture; abstracts of reports of foreign investigations; etc.

EXPERIMENT STATION RECORD VOL. V., NO. 4. Pp. 359–452. 2 il. Contents: An account of the agricultural experiment station at Halle, Germany; abstracts of publications of the agricultural experiment stations and of the U. S. Department of Agriculture; abstracts of reports of foreign investigations, etc.

THE ASSIMILATION OF FREE ATMOSPHERIC NITROGEN BY WHITE AND BLACK MUSTARD. 19 pp. 15 il. (Bulletin No 18, Office of Experiment Stations.) An account of experiments made by J. P. Lotsy, of Johns Hopkins University, with a view to ascertain the extent to which the nitrogen of the air contributes to the growth of the plants in question.

SYNOPSIS OF REPORT ON THE CROPS OF THE YEAR. 4 pp. The final estimates, in condensed form, of the acreage, product, and value of corn, wheat, oats, rye, barley, buckwheat, potatoes, tobacco, and hay, for the year 1893, with estimates of farm prices of these crops.

CRANBERRY CULTURE. 16 pp. (Farmers' Bulletin No. 13.) Compiled for the most part from publications of the Department of Agriculture.

MONTHLY WEATHER REVIEWS. Pp. 269–307, 6 charts. Pp. 309 342, 7 charts. A summary of weather conditions observed throughout the United States compiled from the reports of numerous observers. Intended chiefly for meteorologists.

REPORT OF THE CHIEF OF THE WEATHER BUREAU.—1891–'92. 528 pp. quarto, 4 pls., 23 Figs. Printed by order of Congress. Contents: List of observing stations, description of instruments; article on instrumental corrections, etc.; tables of hourly averages of pressure, temperature, and wind; tabulated meteorological summaries for Weather Bureau stations; tables of mean temperature, extremes of temperature, and dates of first and last killing frost; tables of precipitation at all stations; miscellaneous meteorological tables; observations during a balloon ascension; report on the relations of solar magnetism and meteorology; report on condensation of atmospheric moisture.

Potash Fertilizers Needed.—Fodder crops, pasture grasses, corn stover and hay all remove large amounts of potash from the soil, and these crops occupy a large proportion of our improved lands according to W. P. Brooks of the Massachusetts station (B. 14, B. 18). The urine of our domestic animals contains about four-fifths of the total potash of their excrements, and when the urine is allowed to waste, the manure is poor in potash. When manures are exposed to rains, much of the potash, being soluble, is washed away. Nearly all the special fertilizers are especially rich in phosphoric acid, and do not contain enough potash. Superphosphates were the first fertilizers to come into general use among our farmers. When the farmer buys a fertilizer, he still, nine times out of ten, calls for a phosphate. As a result of the above conditions, our soils seem to be quite generally in need of more liberal applications of potash. In the case of corn the need of potash appears to be particularly prominent. For a good crop of corn the fertilizer used should supply 100 to 125 pounds of actual potash per acre; 200 to 250 pounds of muriate of potash or one ton (50 bushels) of good wood ashes will do this. With ordinary farm or stable manure it will generally pay to use some potash for corn; 125 to 150 pounds of muriate of potash has given profitable results. The liberal use of potash means more clover in our fields, more nitrogen taken from the air, more milk in the pail, a richer manure heap, and storehouses and barns full to overflowing. It means also a sod which when turned will help every other crop. For the potato crop the sulphate appears to be much superior to the muriate of potash, promoting both yield and quality in much higher degree; 300 to 400 pounds of high grade sulphate of potash furnishes enough of this element. For oats, rye and grass, nitrate of soda applied just as the growth begins in spring has proved very beneficial; 300 to 400 pounds per acre should be applied.

Farm Accounts.—Success in farming as in all other business, lies in the correct management of many details, which appear small in themselves, but which, if neglected, make large deficiencies. Prominent among these details, is the one of keeping plain records of all sales and purchases, of the time worked by employés, and of the cost and profit of the various crops. It is impossible to retain all these in the memory, and some written record must be made. If this record is properly planned and arranged, the farmer, by making the entries, not only has a legal record of business transactions, but is able to find out which crops or animals are profitable, and which are losing investments. As the springtime is the beginning of the year's campaign, it is a convenient time to begin keeping a full and business-like set of farm accounts. The methods used in keeping farm accounts need not be complicated. Several very simple systems were described in our last issue, and the necessary books can be had at this office if desired.

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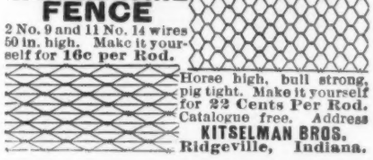

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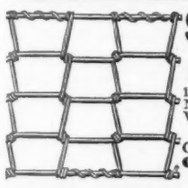

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Profitable Fruit Growing.

Beginning at the northern terminus of the Hudson River Highlands, and extending northward some fifty miles along the shores of the Hudson river and up to the foot hills of the adjoining mountain ranges, is situated one of the most famous and most productive fruit regions in the United States. It was here that Andrew and Charles Downing, Ricketts, Caywood, E. P. Roe and others, who have devoted their life work to the cause of scientific pomology, have had their homes; and the influence exerted by them towards the development of improved fruit culture is still felt throughout this region. The geological formations of the area, as well as the composition of the soils are of a peculiar character. Most of the land is so rough and stony that to farmers who are used to tilling level fields it would appear like folly to attempt its cultivation. Yet here are raised some of the best fruits to be found in the New York markets.

From the very nature of the existing conditions, which make dairy farming and the raising of general field crops an impossibility, the occupants of the land have been compelled to adopt specialty farming, and the specialty which has been found the most profitable is fruit growing. Grapes, raspberries, currants, strawberries, peaches, and pears, are the principal fruits grown. While the best methods of cultivation, pruning, training, and general management of these crops have long since been perfectly understood and practiced, the problem of providing the necessary fertility for the soil in the most economical, and the same time, profitable manner, is of comparatively recent solution. A pamphlet entitled "Fertilizers and Fruit," written by H. W. Collingwood, managing editor of the *Rural New Yorker*, throws much light on this subject. Mr. Collingwood has made a careful exploration of the Hudson river fruit region, visiting all the most successful fruit growers. Their methods of cultivation, system of management, and the causes of their success, as told by themselves, are recorded in the pages of this pamphlet.

QUALITY IN GRAPES.

A. W. Williams, Highlands, N. Y., who has a great reputation for the quality of the fruit from his eighty-acre farm, states:

"Fertilizers have a tendency to ripen the grapes four or five days earlier than when manure is used. They not only ripen earlier, but they ripen better and more uniformly. We have one vineyard of Delawares and Catawbas on a spot where it is not convenient to haul any manure. They have had absolutely nothing but fertilizers from the day they were planted. They are the finest looking grapes we pack, and as for quality, our pickers ought to be good judges, for they pick all over our twenty acres, as well as for other people. Yet, to get grapes for their own eating, they will always go, from choice, right to that spot where manure has never been used. That ought to settle the question of quality. In fact, fertilizers are absolutely necessary to us in order to grow grapes of the highest quality.

"On most of our grapes we use manure when the vines are young to induce a heavy growth of wood, but even this may be overdone and too much wood growth made. I am satisfied with the growth made on those vines where nothing but fertilizer was used. In fact, these vines are sounder and freer from disease than any others. We may not get such a luxuriant growth when less nitrogen is used, but the wood thus made is sounder and harder. "I have not tried any home mixing, but have used mixed goods—the Mapes Fruit and Vine seems to have about the right composition for our use. This contains about three per cent. of ammonia, ten of phosphoric acid, and eleven of potash. If we were to mix at home we should try to get about that proportion."

Mr. J. F. Wygant, Marlboro, N. Y., who has made a good reputation as a grower of fine fruit, and also as a buyer, has forty-six acres, and raises gooseberries, currants, grapes, apples, peaches, and pears.

"I use stable manure only when the plants are young, to promote wood growth and provide a mulch. I can raise the best of gooseberries," he says, "without any stable manure. You can't possibly hurt gooseberries by using chemical fertilizers.

"When setting out I would use half a ton or more per acre, with extra bone meal added. After that at least half a ton every year. I use the Fruit and Vine manure, which is lower in nitrogen and higher in potash and phosphoric acid than the mixtures for potatoes or vegetables. On currants I use half a ton each year.

"Stable manure costs, at the dock, two dollars a ton, and teaming costs seventy-five cents. Compare the analyses and prices of manure and fertilizers, and you will see that the manure is a costly form of fertility as compared with the latter—to say nothing of the extra work it gives both in handling and in killing the weeds it brings on to your farm."

As will be seen from these meager extracts, the most remarkable and important points brought to light in this pamphlet, are the facts that first class fruits can and are raised profitably by the exclusive use of high grade fertilizers without any application of stable manure whatever. While this pamphlet treats mainly on fruit growing, it contains also much valuable information about fertilizers in general, market gardening, and farm management, which no intelligent cultivator of the soil can read without benefit and profit to himself. Readers of the AMERICAN AGRICULTURIST should avail themselves of the generous offer of the Mapes Company, 143 Liberty street, New York, to mail it free to all applicants.

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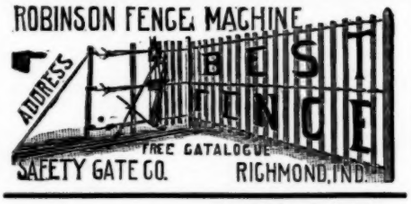

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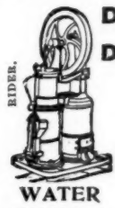

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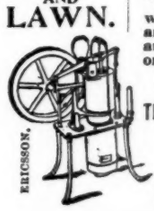

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A farmer can irrigate crops, water stock, sprinkle lawn and have running water in any part of house or barn, or extinguish a fire.

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Hints in Season.

Garget—Swollen Udder.—C. F. Huntsman, Ionia Co., Mich., sends an account of the sickness and death of a valuable cow. Twelve hours after calving the udder began to swell, the fever produced unrellevable constipation, with inflammation of the bowels. The patches of hardened matter in the bowels were coagulated lymph from inflammation of the mucous membrane. Active fever remedies should have been resorted to early. The treatment otherwise seems to have been judicious. The temperature and pulse should have been the guide. The rapid course of inflammation often proves fatal in such cases, in spite of the best treatment. The calf should have been taken from the sick cow, as the drain and annoyance of it must have been injurious. Hot enemas of flaxseed tea, also the same with milk, would have been a good drink. The milk of sick cows should not be fed to the sick cow, nor to any other animals without having been boiled.

Cleaning Seed Oats.—J. E. D., St. Lawrence Co., N. Y., writes us: Seeing several items in the AMERICAN AGRICULTURIST about cleaning seed grains, and oats in particular, perhaps my plan may be useful to some readers. Have the oats free from chaff, then take the lower sieve of the fanning mill, usually called the screen, and put it at the top at such an angle that the oats will easily slide off, and blow the oats all over, and the small seeds of mustard and pigeon grass, together with small oat grains, will go through the screen into the chess boxes. The lighter grain will fall further from the mill and can be kept by itself. The operation works nicely and cleans the grain perfectly.

Blackberries for Home Use and Market.—E. P. Powell, Oneida Co., N. Y., writes us: If I had only my home table to supply, I should grow no Snyders at all, but Agawams only. As I do grow for market the Snyder is so far the berry. Taylor is a close second; and I am not sure but Ancient Briton will displace both after further test. Agawam is inclined to sprawl in growth and does not average large enough. Snyder sends up an erect stiff cane like Kittatinny; but unlike that sort is not inclined to branch out while growing. It need not be cut back till fall or spring. Kittatinny is a splendid berry of the old New Rochelle or Lawton type, and every way better as a fruit than its prototype. But it is not hardy here, and to be grown at all must be protected. Wilson, Wilson Jr., Minnewaska, and Erie are all tender here, although the Erie can sometimes worry through. Wachusette Thornless is much like Snyder and is not thornless. Agawam is a sweet berry and Kittatinny is a tart berry. I cultivate my blackberries for two years, until they get a full hold of the soil, and then let them alone, so far as plow, harrow, and hoe are concerned. They need a rich, cool soil, well drained but moist.

Tanning Skins With the Fur On.—E. M. Walden, Larimer Co., Col.: Ordinary skins, like those of the beaver, otter and mink, are readily tanned by stretching them when fresh over or on a board with the fresh side out. Make a mixture of equal parts of salt and alum dissolved in water, adding coarse flour or wheat middlings enough to make a paste the consistency of thick cream. Spread this over the skin to the depth of a quarter to a half inch thick, and leave it on for three or four days, or until dry, then carefully scrape off and apply another coat. When the second coat is dry, remove and work the skin with the hands until it is soft and pliable. Of course all lumps of flesh and fat should be removed before applying the alum part. For very oily skins, like those of the raccoon, the parts may be made of say, two ounces each of salt and alum, and one dram of sulphuric acid in a pint of water, then thicken with the wheat middlings. The alum sets the hair and fur, and prevents it falling out. Coloring and polishing the tanned skins may be done to suit one's fancy or taste in such matters.

Fifty Varieties of Poultry.—We call particular attention to the advertisement of Chas. Gammerdinger, Columbus, Ohio, in another column. He has a fine collection of fowls, over fifty varieties, and made a big display at ten large State shows with 400 birds last fall, winning over 1,000 first and second premiums and many display prizes. He was also a lucky winner of several hundred premiums at regular poultry shows. Send for his catalogue, it is a good one.

A Woman's Heart

Is always light when her home is clean and bright.

Gold Dust Washing Powder

Makes everything clean and bright. The floors, the doors, the pots and pans, the silver ware and dishes have an entirely different aspect when this modern labor-saver is used. It's the most popular cleaner, at the most popular price. Ask the Grocer for it.

The N. K. Fairbank Company,
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has a charm peculiarly its own. It represents the result of your own skill and care. The D. & C. Roses are the only roses bred especially for home culture. You can get them by mail on their own roots and grow your own roses in abundance. Our

NEW GUIDE TO ROSE CULTURE

will help you to select roses and other flowers of your choice and give you explicit instructions for their culture and care. If you so request, we will send free, this book and a sample copy of our floral magazine,

"SUCCESS WITH FLOWERS."

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FRUIT and ORNAMENTAL.

SMALL FRUITS, GRAPES, SHRUBS, EVERGREENS, ROSES, HARDY PLANTS,
FOR SPRING PLANTING.
Handsome new 160 page Catalogue Free.
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Mt. Hope Nurseries, Rochester, N. Y.
Awarded Several Medals at the World's Fair.

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Headquarters for Pear, Plum, Apple, Nut, and all other Trees, of the best. Also the finest and best **Strawberries**, and **Choice Small Fruits.** *Write for our Catalogue of 1894.* You will be interested in our **Big 4 Jr.** and **Frost Proof** Strawberries. **THE ROGERS NURSERY CO.,** *Agents Wanted.* (Department G.) **Moorestown, N. J.**

SWITZERLAND SEED SOWER.

It will sow from 30 to 50 acres per day of Clover, Timothy, Millet, Hungarian, Hemp and Flax. It is light and simple. Price, $1.50. Special inducements given to agents. Address, **D. E. McDOWELL,** Middlesborough, Ky.

BEE KEEPERS SEND FOR Sample copy of CLEANINGS IN BEE CULTURE. A Handsomely Illustrated Magazine and Catalog, of BEE SUPPLIES FREE. A. I. ROOT, Medina, O.

GRAPE VINES

On receipt of $1.00 I will mail postpaid a Practical Treatise on **"Grape Culture"** and in early spring 12 vines, 4 each Niagara, Brighton and Worden, best white, red and black varieties. First class. Safe arrival in good condition guaranteed. Price list free. Early orders solicited. **J. H. TRYON,** Willoughby, Ohio.

READER If you love RARE FLOWERS, *choicest only*, address ELLIS BROS., Keene, N. H. It will astonish and please. **FREE.**

Answers to Correspondents.

Renewing Fence Posts.—Joseph Craig, Paulding Co., O.: Common petroleum is a most excellent and cheap preservative for fence posts. Before or after the posts are set in the ground, bore an inch hole downward in the top and center of the post, and to a depth of from six to ten inches. Fill this hole with crude petroleum and put in a cork or wooden plug to keep out the rain. When the petroleum has been absorbed by the wood fill again and repeat until you think that the preservative has reached the bottom of the post. By this plan you saturate the center of the post first, and the preservative will work its way outward soon enough. If you want to cure timber expressly for fence posts we would advise planting white oak or yellow locust, provided the latter will succeed in your locality, and is not attacked by borers.

Value of Wood Ashes.—Subscriber, Cumberland Co., N. J.: Chemists tell us that the only really valuable plant nutrients in wood ashes are potash and phosphoric acid. A good article of hard wood ashes contain about six per cent. of potash and nearly two per cent. of phosphoric acid; the former is worth about five cents a pound, and the latter six in the market. In the form of muriate, potash can be had for less than five cents per pound, but we will leave the figure at five, and this would make a ton of ashes worth $9.40. We might add the odd sixty cents, however, for a little nitrogen, which might be absorbed from the atmosphere if the ashes have remained long in a heap under cover, making the ashes worth $10 per ton. Ashes also contain considerable lime, but if this is wanted for applying to land it can be obtained cheaper in other forms than in wood ashes.

The Cowpea.—Wm. H. Lingo, Sussex Co., Del.: The so-called cowpea of the Southern States is not a true pea, nor is it a bean, but it belongs to an intermediate genus, the *Vigna sinensis*, introduced many years ago from the East Indies. There are now in cultivation some twenty or more varieties known under local names, and all are valuable in the South for green fodder, for hay, and for plowing under as a fertilizer. The seed is usually sown about corn planting time, and at the rate of about one bushel per acre. If seed is the object, then the plants are undisturbed until the pods begin to color, when the plants are cut with a scythe and stacked up until dry enough for threshing. The yield per acre will of course be extremely variable, or from five to ten bushels on poor soils, up to twenty or more.

Juneberries.—F. Baxter, Essex Co., N. J.: There are an almost innumerable number of native varieties of the common Juneberry or Shadbush (*Amelanchier Canadensis*). These varieties are exceedingly variable, not only in the size and form of their leaves, but in the growth and productiveness of the plants. Some grow to trees thirty to forty feet high, with stems twelve to twenty-four inches in diameter, while the extreme in the opposite direction is to be found in the dwarf varieties, which are slender-stemmed shrubs, seldom growing more than three feet high and multiplying rapidly by stolons and subterranean stems. As a rule, the dwarf Juneberries produce the largest fruit, and are most productive; consequently they are usually recommended for cultivation. But in our Eastern States the berry-eating birds are so numerous and so fond of these Juneberries that they rarely leave any to become fairly ripe unless they are protected by netting. In some of the Western States, where the birds are less numerous than here, or are not so voracious, these berries are said to ripen fully, and therefore are highly prized for the same purposes as the raspberry and blackberry. A few years hence there will probably be much larger and better varieties in cultivation than now.

Nasal Ulcers in Sheep.—James Norton, Yellowstone Co., Montana, has a number of sheep that have small sores just inside the nostrils, causing the sheep to sneeze while feeding. There is a discharge from the nose, but no fever or loss of appetite or flesh, nor cough. This is a result of nasal catarrh. Separate the sick sheep from the well, and keep the sick ones shut up, and give the following compound: Four ounces of powdered sulphate of iron, two ounces of flowers of sulphur, one ounce of powdered catechu, and one ounce of powdered gentian; mix, and add it to four pounds of oatmeal in which a small handful of common salt is added. Mix all thoroughly, and give a tablespoonful of the powders thus mixed, stirred up in molasses, on a wooden spatula or smooth wooden knife or piece of shingle, twice a day. To the ulcers, after cleansing with warm water, apply by syringe a teaspoonful of carbolic acid in half a pint of water; or the solution may be applied on a swab, though it is not quite so cleanly a method. Or a solution of ferric alum of one dram to a half-pint of water, applied in the same way as the carbolic acid solution; or the two solutions may be mixed and used as above.

A Secure Fence.—Many farmers have been greatly bothered in the past by their stock being injured on barbed wire fence, because the cattle could not see the fence at times, but with pickets fastened on the fence every few feet apart it is more easily seen; besides that, the pickets serve to keep the fence wires the proper distance apart. When a machine can be bought for a few dollars that will do this work it becomes apparent how much better it is for the farmer than to have to tear down his fence and build some other kind; besides he has a machine with which he can build a regular picket fence whenever he wishes. Such a machine is manufactured by the Lansing Wheelbarrow Co., Lansing, Mich., who will send their circulars free to all applicants.

Jaundice or Yellows in Swine.—Ephraim Stone, Meigs Co., Ohio, has a breeding sow that has yellow eyes, ears, and skin. She seems dull, and has lost her milk, but as the pigs eat now, that is of no account. The derangement of the liver will, if only functional, be removed by castor oil, half a pint, followed by a tablespoonful of sulfate of soda dissolved in water and added to the milk fed every other morning. Half a dram of sulfate of iron mixed with an ounce of powdered gentian, and given in teaspoonful doses each meal will give tone to the system.

Improving Each Month.—The AMERICAN AGRICULTURIST is improving each month. The longer I read it the better I like it. I have taken it for about seven years.
EDWIN P. COLE, Ulster Co., N. Y.

World's Fair honors, words of praise, and scientific indorsement justify the statement

AYER'S Sarsaparilla CURES Absolutely

As a Spring medicine, for boils, pimples, and for that all-gone feeling, take AYER'S

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Other sizes proportionately low. Every Scale warranted. | Sent on trial.
Catalogue Free. Address
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And all others interested in **Rural Life.** We supply any book published on the above subjects. **CATALOGUE** of **600** standard works **Sent Free.**
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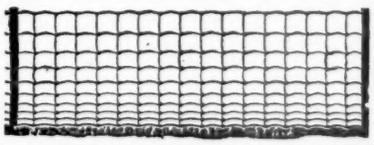

A PRACTICAL TEST

of any fence can be made in small lot, with a wild steer, and an active dog, but our plan answers the same purpose. Suspend a barrel of dirt by a 20 ft. chain close to the sample fence. Let two strong men pull back and "bang" the barrel into the fence until **men or fence get "tired."** If it's the men, it's the **Page.**

PAGE WOVEN WIRE FENCE CO., Adrian, Mich.
PAGE WIRE FENCE CO. of Ontario, L'td.
Walkerville, Ont.

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23 Sizes and Styles, Over 20,000 In Use.
A boy can operate and keep them in order. A complete mill and sheller for less than **$100**
EVERY MILL WARRANTED.
"BOOK ON MILLS" and sample meal **FREE.**
Flour Mills built by Contract.

ROLLER OR BUHR SYSTEM.

Established 1851.

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Dollars

Have been expended in building irrigating canals in Kern County, California, and already they form a fructifying network throughout hundreds of thousands of acres, and render the farmers independent of the seasons, and enable them to produce a succession of crops of almost every conceivable variety in a luxuriance not excelled in the most highly favored portions of the earth.

Every cereal, vegetable, fiber, plant and fruit of the Sub-tropical temperate zones flourish in perfection, and the genial disposition of the climate is such that farmers can plough and plant continuously, and thus obtain two and even three harvests in the same period within which the Eastern farmer deems himself fortunate if he can reap but one.

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FREE TRAINS
—TO—
Bakersfield,
KERN COUNTY, CALIFORNIA,

Will Run During February and March.

The Kern County Land Company
—HAS—
400,000 ACRES

Of choice land located in the fruit belt of Kern County. It is all for sale on easy terms in tracts of ten acres and upward.

If you would like to own a home in the Golden State of California, to live among vines, fruit trees and semi-tropical foliage of that favored State, and if you want to know the best way to get there and what it costs to secure for yourself and family a delightful California home, elegantly illustrated pamphlets and descriptive circulars will be furnished on application.

Write to the

KERN COUNTY LAND COMPANY,
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NEW YORK CITY.

Catalogues Acknowledged.

ALNEER BROS., Rockford, Ill. Catalogue of reliable garden seeds giving descriptions and illustrations of all the leading kinds.

BRADLEY FERTILIZER CO., Boston, Mass. Catalogue of the Bradley Standard Fertilizers. A very handsome pamphlet presenting a large number of photographic views of farm and garden crops grown with the use of these fertilizers; also giving directions how to use and apply them to the best advantage.

W. ATLEE BURPEE & CO., Philadelphia, Pa. Manual of their prize live stock and fancy poultry. A pamphlet giving portraits and descriptions of rough-coated Scotch collies; purebred sheep and swine; and the best breeds of poultry. Also special advertisements of horticultural and agricultural seeds.

C. A. BARTLETT, Worcester, Mass. Catalogue of poultry foods and poultry supplies of all kinds.

ALFRED BRIDGEMAN, 37 East Nineteenth St., New York. Descriptive and illustrated catalogue of vegetable, flower and grass seeds, garden tools, etc.

CLEVELAND NURSERY CO., Rio Vista, Va. Wholesale price list of small fruit plants, grapes, fruit and ornamental trees. Several valuable novelties.

CRYSTAL PACKAGE CO., Benton Harbor, Mich. Descriptive catalogue of the Crystal Butter Package—a neat and attractive butter package for which it is claimed that it can be used one hundred times, shipped and returned time after time yet as pure and sweet, bright and sparkling as when first used.

HENRY A. DREER, Philadelphia, Pa. Dreer's Garden Calendar. A remarkable handsome catalogue, giving in its 152 large pages a complete list of the best and newest vegetable, flower, grass and field seeds, bulbs and regrowths, together with valuable practical cultural directions. The artistic beauty of the colored portions of a bunch of cosmos and sweet peas on the cover pages, is especially noteworthy.

FARMER'S SEED CO., Chicago, Ill. Special pamphlet on permanent pastures and meadows. Special offer for samples of thirteen kinds of grasses.

D. M. FERRY & CO., Detroit, Michigan. Seed annual. A large, handsome catalogue of vegetable, flower and field seeds; flowering bulbs and roots, garden implements, etc. Among the leading novelties offered are Columbian Mammoth White Asparagus and many other desirable kinds.

GREEN'S NURSERY CO., Rochester, N. Y. A handsome descriptive and illustrated catalogue of fruit trees, strawberries, raspberries, blackberries, currants, grapevines, ornamental trees and plants, etc. Royal Church raspberry and Timbrell strawberry are leading novelties.

GOOD & REESE CO., Springfield, O. This is one of the most attractive nursery catalogues that have appeared this season. It presents a rich array of treasures of farm, garden and greenhouse, and is especially complete in its list of choice roses; several fine colored plates.

JOHN W. HALL, Marion Station, Md. Catalogue and price list of seed potatoes, berry plants, etc.

D. HILL, Dundee, Ill.: Catalogue of evergreen and deciduous ornamental and forest trees. The proprietor of this establishment warrants his trees first-class in every respect. The catalogue contains a good deal of valuable information on tree planting and care of trees.

JEWELL NURSERY CO., Lake City, Minn. This firm makes a specialty of the North Star currant for which it is claimed to be the most delicious, hardiest, and profitable kind in cultivation.

JOHNSON & STOKES Philadelphia, Pa. Garden and Farm Manual. The catalogues of this firm appear to be constantly improving in artistic embellishments as well as in completeness. The present one is especially rich in excellent photographic illustrations. In addition to the large catalogue of seeds, plants, implements, etc., they issue also special ones on poultry and bee keepers' supplies.

ALFRED LEIDA, Delaware, N. J. Illustrative and descriptive catalogue of high-bred poultry of all the most popular breeds.

D. LANDRETH & SONS, Philadelphia, Pa. With the 110th year of continuous business this firm issues a catalogue of remarkable completeness. Many promising novelties in all lines are offered, and the monthly hints are, as usual, valuable and interesting.

T. F. MILLER, Mattituck, L. I., N. Y. Descriptive circular and price list of Golden Wyandottes, White Wyandottes, and White Plymouth Rocks. Mr. Miller has bought the stock owned by Tenny & Harrington, Wellesley Hill, Mass.

J. T. LOVETT CO., Little Silver, N. J. Guide to Fruit Culture. A very handsome pamphlet of nearly 100 pages in which are illustrated and described all the leading varieties of small fruits, orchard fruits, nuts, garden roots, roses, chrysanthemums, the World's Fair Cannas, etc. Several beautiful colored plates. The cultural instructions are one of the leading features. It will be mailed for ten cents, by J. T. Lovett, Little Silver, New Jersey.

WM. HENRY MAULE, Philadelphia, Pa. Catalogue of seeds for the farm and garden. Ornamental and flowering plants, fruit trees, and small fruits, etc. A handsome pamphlet of 120 pages with a great many illustrations and several fine colored plates representing some of the most valuable novelties offered.

L. L. MAY & CO., St. Paul, Minn. Illustrated and descriptive catalogue of seeds, plants, bulbs, and fruits. Several very tempting offers of special collections at low cost.

F. B. MILLS, Rose Hill, N. Y. Price list and catalogue of flower and vegetable seeds. New potatoes a specialty.

T. V. MUNSON, Denison, Tex. Catalogue of fruit trees, small fruits and grapevines. Headquarters for Munson's hybrid grapes.

DUANE H. NASH, Millington, N. J., and 30 South Canal St., Chicago. Illustrated and descriptive catalogue of the world renowned Acme pulverizing harrow, clod crusher, and leveler. This implement is almost indispensable to a progressive farmer if he would keep in step with the times.

L. L. OLDS, Clinton, Wis. Catalogue of seed potatoes. All the best new and standard varieties. The World's Columbian Exhibition medal was awarded to this collection.

ORCUTT SEED AND PLANT CO., San Diego, Cal. Price list of California and Mexican seeds, bulbs, and plants.

M. RUMELY CO., La Porte, Ind. Illustrated and descriptive catalogue of threshing machinery, engines, water tanks, separators, saw mills, etc.

E. W. REID, Bridgeport, O. Catalogue of general nursery stock. This firm makes a specialty of selling its trees and plants direct to customers, insuring satisfaction and lower prices. The Timbrell strawberry, Eldorado blackberry, and Lorenz peach are among the newer fruits introduced by this nursery.

STEELE, BRIGGS, MARCON SEED CO., Toronto, Canada. Illustrated and descriptive catalogue of flowers, vegetables and field seeds, ornamental plants and several special combination offers.

C. C. SHOEMAKER, Freeport, Ill. Almanac and

(*Continued on Page* 174.)

Catalogues Acknowledged.

(*Continued From Page* 173.)

catalogue of pure-bred poultry, giving excellent illustrations and full descriptions of all the leading breeds of poultry, together with practical hints and directions of interest to every poultry raiser.

JOHN A. SALZER SEED CO., La Cross, Wis. Catalogue of farm and garden seeds. An attractive pamphlet of 130 pages, giving special attention to northern grown seeds; choice oats, potatoes, and other farm seeds for which this firm has an enviable reputation.

J. M. THORBURN & CO., 15 John street, New York. Descriptive and illustrated catalogue of seeds for the flower and vegetable garden, the lawn, farm and nursery. This is claimed to be the largest collection in the world, and it has always been the business principle of this firm to supply only the very highest class of seeds.

VILMORIN-ANDRIEUX & CO., Paris, France. General catalogue of seeds, strawberries and flowering bulbs. One hundred and eighty-six pages are closely printed with the names of the varieties of this wonderful collection.

G. C. WATSON, Philadelphia, Pa. Special trade offer of gloxinias, gladiolus, lilies, iris, cannas, tuberous and other spring bulbs; also Watson's mushroom spawn.

Fungicides and Seed Germination.—The prevention of plant diseases by treating the seeds with fungicides is increasing with our knowledge of the injurious fungi. The effect upon the germinating power of the seed, of such chemicals as are likely to be used as fungicides, has been studied at the Kansas station by A. S. Hitchcock and M. A. Carleton (B. 41). A comparison of such seeds as wheat, pumpkin, lettuce, mustard, alfalfa, tomato, castor bean, and American corn showed the effect of the same chemical to be practically the same on all, considering the differences in the resisting powers of the seed coats. A fixed number of grains of maize were soaked for a certain time in a definite strength of the chemical to be tested, and the percentage of germination was noted. A check experiment was carried on at the same time in which water was used in place of the chemical solution. Eighty-two chemicals were tested for various strengths and for various periods of time, making a total of about four hundred experiments. The chemicals which affected the vitality of the seed the most were mercuric chlorid, arsenious oxid, cadmium bromid, and potassium cyanid. Germination was scarcely affected by soaking for forty-eight hours in ten per cent. solutions of alum, saltpeter, and sodium sulfate. The latter is the most common "alkali" of arid regions. The effect upon the vitality of the seed is shown first by the germination being retarded, and finally by the entire prevention of germination. In general the effect is proportional to the time and strength of the solution. A chemical to be of practical value as a fungicide, must not be used in a solution of such strength as to injure the vitality of the treated seed. Chemicals should show unusual fungicidal properties, if they can only be used in very weak solutions, or for short periods. Those which are injurious only in strong solutions for a long period may be safely tried when the strength or time is reduced. Hot water alone is often a good fungicide.

An Important Announcement.—Canada Unleached Hard Wood Ashes make one of the best low cost fertilizers; the difficulty heretofore having been to get the genuine unadulterated article at a reasonable price. It has lately been announced that F. R. Lalor, the well-known exporter of Maple Brand Ashes, of Dunville, Ont., and John Joynt, of St. Helens, Ont., another well-known shipper of hard wood ashes, have joined forces with the old firm of Munroe, DeForest & Co., of Oswego, N. Y., the firm now being known as Munroe, Lalor & Co. The new firm will make a specialty of Canada Unleached Hard Wood Ashes, and as all their ashes will be gathered, loaded and shipped under the personal supervision of the Canadian members of the firm, they will no doubt be able to satisfactorily supply any one with the desired article at a reasonable price. The selling office is at Oswego, N. Y.

Authority on Rural Subjects.—I have been a constant reader of the AMERICAN AGRICULTURIST for some years, as I consider it the best authority on rural subjects.

WM. G. SPRACKLEN, Parker Co., Texas.

God Bless You.—I have always been a son of toil, and have derived a great deal of benefit from reading your paper. I can see many changes for the better, and improvements which have been suggested by it. God bless the AMERICAN AGRICULTURIST! HENRY TEACHOUT, Coffey Co., Kan.

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Complete with Stool and Instruction Book. Safe delivery guaranteed. Price $42.50 cash, or $45.00 if cash is sent us after ten days' trial in your own home, or $50.00 on credit—$10.00 down, and $5.00 per month. **This offer stands unequalled** in the annals of Organ making. It is the **red letter offer of a lifetime.** This is our No. 23,000

GOOD HOPE ORGAN,

(exactly like cut), absolutely perfect, containing all the latest improvements. Solid Black Walnut Case, 10 Effective Stops, 4 Sets of Reeds, Double Octave Couplers, New Tone Swell, Grand Organ Swell, **Specially WARRANTED for 10 years.** The *Regular Retail Price of this Organ is $78.*

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$25 AND UPWARD GREAT VARIETY ALSO WATER CARTS, SPRINKLERS & HAY CARTS. WIDE & NARROW TIRES 2 & 4 WHEELS.

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SOWS CLOVER, TIMOTHY, ALFALFA, RED TOP, FLAX, and all kinds of GRASS SEEDS. Sows any quantity. *Evenly, Accurately.* 20 to 40 ACRES per DAY. *Send for circulars.* in wet, dry and windy weather. Weight 40 lbs. *See our Banner Root Cutter on another page.*

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READING MATTER. Twelve illustrated periodicals (all different) postpaid 25c., one dollars'worth of magazines 25c., three packages of either 50c. CHAS. E. HOUGHTON, Lynn, Mass.

Changes in the Tenure of Farms from 1880 to 1890.

Showing the number and proportion of farms cultivated by their owners, also by tenants, in 1890, compared to 1880, with the total and percentage increase or decrease.

[This table will be discussed in detail in our next number.]

CLASSIFICATION OF FARM TENURE BY GROUPS OF STATES.	*North Atlantic.*	*South Atlantic.*	*North Central.*	*South Central.*	*Western States.*	*United States.*
Owned farms, 1890	537,376	461,057	1,474,086	668,972	128,237	3,269,728
Ditto 1880	584,847	411,673	1,350,225	565,556	72,005	2,984,306
Increase or decrease	−47,471	+49,384	+123,861	+103,416	+56,232	+285,422
Percentage increase or decrease	−8.11	+11.99	+9.17	+18.28	+78.09	+9.56
Tenant farms, total 1890	121,193	288,543	449,736	417,800	17,641	1,294,913
Ditto 1880	111,292	232,756	347,743	321,092	11,718	1,024,601
Increase or decrease	+9,901	+55,787	+101,993	+96,708	+5,923	+270,312
Percentage increase or decrease	+8.89	+23.96	+29.32	+30.11	+50.54	+26.38
Farms rented for cash, 1890	52,120	96,098	147,248	151,901	17,292	454,659
Ditto 1880	49,011	74,946	88,743	105,092	4,565	322,357
Increase or decrease	+3,109	+21,152	+58,505	+46,809	+2,727	+132,302
Percentage increase or decrease	+6.34	+28.22	+65.92	+44.54	+59.73	+41.04
Farms worked on shares, 1890	69,073	192,445	302,488	265,899	10,349	840,254
Ditto 1880	62,281	157,810	259,000	216,000	7,153	702,244
Increase or decrease	+6,792	+34,635	+43,488	+49,899	+ 3,196	+138,010
Percentage increase or decrease	+10.90	+21.94	+16.79	+23.10	+44.68	+19.65
In every 100 farms there were cultivated by owners in 1890	81.59	61.50	76.62	61.55	87.90	71.63
Ditto in 1880	84.01	63.88	79.52	63.78	86.00	74.44
Occupied by tenants in 1890	18.41	38.50	23.38	38.45	12.10	28.37
Ditto in 1880	15.99	36.12	20.48	36.22	13.99	25.56
Tenants who paid cash rental in 1890	7.91	12.81	7.65	13.97	4.99	9.96
Ditto in 1880	7.04	11.62	5.23	11.85	5.45	8.04
Rented on shares, 1890	10.48	25.67	15.69	24.46	7.09	18.40
Ditto 1880	8.94	24.48	15.25	24.36	8.54	17.51

AT HOME AND ABROAD.

The Prospects in Washington.

The unusually heavy rains have destroyed one of the largest crops of grain that has ever been grown in Eastern Washington State. It was destroyed in all stages and conditions since harvest began. Much of the first threshed was sprouted. Thousands of bushels spoiled after being delivered to the warehouses and elevators. Thousands of acres are still uncut, and at every opportunity through the winter the headers have been trying to cut what they can, and the threshers try to thresh it. This will, no doubt, continue until spring with the club varieties, which are all very stiff strawed. There has been, at the least calculation, six million bushels of grain destroyed. Still everybody is trying to keep up courage and fight it through, by trying to make another crop. The low price of wheat, which is only thirty-two cents per bushel, has caused many to start diversified farming. This should have been done long ago, as this State is naturally adapted to dairying, fruit, hops and sugar beets. It has been fully demonstrated that the above industries can be made to pay. Our hops have a world-wide reputation for good quality. Fruits of all kinds, from the currant to the apple, are perfect in size, color, flavor, and for long shipments and keeping qualities are unexcelled. Our climate is so varied that almost any one can be suited in some part of the State. For health, plenty of pure water and no insects to annoy man or beast, no place in the world can surpass the State of Washington.

I. N. BATTHIS, Spokane Co., Wash.

A Reminiscence and Lesson.

Twenty-three years ago a near neighbor of mine gathered a pocketful of English walnuts from under a row of old trees which were then, and are still, growing at Manhattanville, now within New York city limits. On reaching his home in New Jersey, this neighbor concluded to plant a few of these nuts. The next spring the seedlings appeared, and during the ensuing summer they made a vigorous growth. In the following autumn or spring these seedlings were dug up for transplanting, but upon looking them over the grower said, "What is the use of bothering myself with these little things, for it is not at all likely that they will come into bearing in less than twenty years, and perhaps not then." So he gave them all away to his neighbors, who, it seemed, appreciated the gift and bestowed some care upon the trees. Sequel: The twenty years have gone by, and my neighbor is still cultivating his farm and attending to his fruit garden, while the men to whom he gave the nut trees have passed away, but now their children frequently greet a certain man somewhat as follows: "Oh, Mr. H., I've waited to see you for some time, just to show you what handsome English walnuts we are gathering from the trees you gave father so many years ago."

Mr. H. himself has no bearing trees of this walnut on his own place, because, in "casting bread upon the waters," he neglected to keep a few crumbs for himself and family, and now regrets his own want of forethought.

A. S. FULLER, Bergen Co., N. J.

Market Houses for Small Towns.

Every town having more than three thousand inhabitants ought to have regular markets held in market houses and squares where the people of both city and country could come and buy direct from the producer, and thus do away with so much of farm produce being handled by middlemen. The market should be held two to three times a week, and on Saturdays all day if desired by the people. There is plenty of time for all classes to go to market. As the hours of labor are short on Saturday in most cities the producer has the advantage of making his own selections and getting such articles as suits him both fresh and good. I am trying to induce the dependent people that live in towns and cities, tradesmen as well as others, to leave the cities, for as soon as the business or trade becomes dull they suffer a famine unless they have laid up enough to carry them through the winter or until the business gets better. However small a farm one has he can grow nearly all his living and so far is independent.

JOSIAH BEARD, Sangamon Co., Ill.

Better Than a Hundred Dollar Cyclopedia.—We have taken the AMERICAN AGRICULTURIST for nearly thirty years. I have frequent occasion to refer to the back volumes and find that I can get more solid practical information out of this set than I do from our $100 cyclopedia.

CHAS. H. FULLER, Somerset Co., Me.

CURES OTHERS

For Severe, Lingering Coughs, Weak Lungs, Bleeding from Lungs, Bronchitis, Asthma, and Consumption, in its early stages, Dr. Pierce's Golden Medical Discovery is a sovereign remedy. It not only cures the cough but also builds up the strength and flesh of those reduced below a healthy standard by "Wasting Diseases." Will not make fat folks more corpulent.

MR. WILEY.

B. F. WILEY, of *Box Elder, Converse Co., Wyo.*, writes: "I had bronchitis for twenty years and over, and I could not work without coughing so hard as to take all my strength away. I took five bottles of Dr. Pierce's Golden Medical Discovery, and give you my word and honor that I can do any work that there is to do on my 'ranch' without coughing. I have not taken any of the 'Golden Medical Discovery' for a year."

WHY NOT YOU?

TALKS WITH MOTHERS.—No. 2.
FEEDING THE BABY.

Much is written at the present day about the care and feeding of infants by people whose only capability for dealing with the subject is a fertile brain, and whose only aim is to appear in print; every mother knows how unsatisfactory and fallacious such advice is when she attempts to follow it. How to feed the baby is the greatest problem met with in the happy state of motherhood, and upon its solution depends the health, the happiness and the life of the child. If the mother is able to nurse her child, the question of feeding is practically settled; if she is not, she should be guided by those who have had successful experience in feeding babies and not allow herself to experiment with different foods. There are scores of artificial foods offered for sale, but the best is none too good for the baby. Eminent authorities who have thoroughly investigated the subject of infant feeding, and scientists who have analyzed infant foods, unite in pronouncing Mellin's Food to be the only perfect substitute for mother's milk. It is palatable, nourishing and strengthening; the weakest stomach will retain and digest it, and the puniest child will thrive upon it beyond the mother's fondest expectations.

For convalescents, consumptives, dyspeptics and the aged, Mellin's Food is also of incalculable value. It is a food, not a medicine, and the system receives the nourishment it demands for its daily needs. For those severely ill Mellin's Food will sustain the failing strength and promote a speedy recovery when convalescence has been established.

◆ GIVE THE BABY ◆

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FOR INFANTS AND INVALIDS.

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$90 Top Buggy	$52.50
$65 Top Buggy	36.75
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Notes From Other Countries.

Samples of tea-seed oil have been sent from Ceylon to London, with a view to opening a market for this by-product. It is not a new product, but has long been used in China for cooking and lighting.

A plot of the new forage plant *Lathyrus silvestris*, at the Royal Agricultural college, Cirencester, England, flourished last summer through the severe drouth, which withered nearly all other varieties of forage plants. A cutting, May 30, yielded at the rate of a ton and a half to the acre, and a second one in August was also heavy.

The cultivation of the cola nut has been successfully introduced into India, and is attracting much attention there. The tree begins to bear fruit four or five years after it is planted, and is easily propagated. The wonderful endurance shown by the West African negroes, who habitually masticate the bean when they have any specially hard work to perform, has long been known, and the drug seems now to be coming into more general use for the preparation of a drink very similar to cocoa or chocolate. A large consignment has recently been sent to France, where the military authorities are taking it up for use in the army. A demand is also said to be developing in connection with the preparation of artificial fodder, which appears to be improved by the admixture of a certain amount of the coarser qualities of the bean. Recent researches show that while cola contains but little of the astringent, tannin, which is so prominent a feature of both tea and coffee, it possesses about the same proportion of the refreshing theine as occurs in these beverages.

The inquiries of the Royal Commission on Agriculture bring out many facts showing great falling off in the value of farming lands in England. Among others Sir Michael Hicks Beach testified that a farm of about 8,000 acres in Wiltshire, adjoining his own, and which was sold thirty years ago for £26,000 was sold less than two years ago for less than £8,000. He also testified that the land-tax and tithes amounted to fifty per cent. of the present spot rent, which has fallen off one-half in ten years.

An opportunity for competitive exhibitions of churns will be afforded at the Royal Dublin Society's Show, April 18th. A prize of twenty-five dollars is offered for the best "speedy" churn, besides a silver medal, should the judges deem the winner of sufficient merit. The churns must be capable of making ten pounds of butter at one churning, and be conveniently workable by one man.

An important law has recently been enacted by the Imperial Council of Russia, providing for the inalienability of the plots of land granted to the peasants when the serfs were freed. The farming class will derive much benefit from the new measure, as it protects them from the liability of falling into the hands of speculators and usurers, who

(*Continued on Page* 177.)

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"A" Grade, $130.

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TREES Pear, Apple, Peach, Chestnut, Walnut. Send for Catalogue.

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FULLY WARRANTED.

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For the common ills of life liable to occur to any one, *Dropped on Sugar, Children Love* to take it for Croup, Colds, Sore Throat, Cramps and Pains.

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Accordions, Auto Harps, Auto Harp Music, Banjos, Banjo Music, Violins, Violin Music. Violin Bows, Violin Cases, Guitars, Guitar Music, Clarinets, Clarinet Music, Cornets, Cornet Music, Flutes, Flute Music, Violin Repairing, Harmonicas,

C. C. STORY, 26 and 28 Central St., Boston, Mass.

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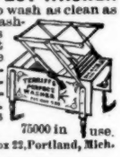

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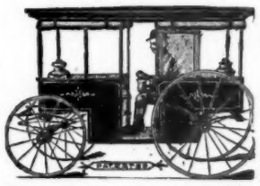

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$3 PRESS prints cards, &c. Circular press $8. Small newspaper size $44. Great money maker and saver. All easy, printed rules. Write for catalogue, presses, type, paper, &c., to factory,

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$12 TO $35 PER WEEK Can be made by working for us. Parties preferred who have a horse and can give their whole time to our business. Even spare time will pay splendidly. This announcement is of special interest to farmers and farmers' sons, and others residing in the rural districts. A few vacancies also in towns and cities. **B. F. JOHNSON & CO., No. 5 South 11th St., Richmond, Va.**

California Lands.

We have for sale some of the finest Fruit lands in California, at low prices and easy terms. If you are coming here write for particulars, it will save you money, and costs nothing.

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CANADA UNLEACHED HARDWOOD ASHES

A Natural Fertilizer at Low Cost. Ashes gathered with our own teams and shipped to any railroad point in carload lots, quality and weights guaranteed. Write for prices, pamphlet and any information to

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HANDY COBBLER COMPLETE SHOE and Harness Kit for home use. Great time and money saver. Articles separate cost $6. Price 26 articles, boxed, 20 lbs., $5. No. 2 without extra harness tools, 22 articles, 17 lbs., $2. Catalogue free. Agents wanted. In order give R. R. or Exp. station and name this paper.

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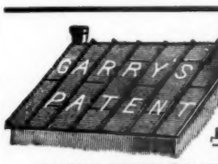

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Neponset Water-Proof Fabrics

They cost very much less than shingles. Absolutely Water-Proof, Frost-Proof and Air-Tight. Any one can put them on. They will save you money.

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ROOM 9x9 Costs about $2 — Price much less than oil cloth of any kind and will wear for years.

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F. W. BIRD & SON, SOLE MANUFACTURERS,

EAST WALPOLE, MASS.

Notes From Other Countries.

(*Continued from Page* 176.)

have up to the present taken advantage of their lack of business ability to wring their property from them. According to the terms of the law no commune will be allowed to sell any of the land which it acquired at the time of the emancipation, unless at least two-thirds of the inhabitants are in favor of the sale. In cases where the value of the land is under five hundred rubles, the sanction of the provincial authorites is required; while, when the ground is worth more than that amount, the consent of the Minister of the Interior must first be obtained. As regards the peasants individually, they will only have the right of selling their land to members of the same class as themselves. It is hoped that the benefits thus conferred on the tillers of the soil will prevent the spread of socialist opinions in the country districts.

A Brazilian cactus, *Opuntia Dillenii*, which tradition says was carried to the Deccan, India, by a Mahratta sirdar, has become a vegetable pest, notwithstanding its adaptability to form living fence, or to cover the barren and denuded uplands of the Deccan with vegetation. It is enormously aggressive, its joints striking root wherever they may be carried by man, by wind or by water, and the seeds are deposited by birds which eat the fruits. When once the plant has been established as a living hedge it very soon invades the property it was brought to protect, and soon occupies the ground to the exclusion of other vegetation. The British-Indian authorities are taking vigorous measures for its eradication.

The breeders of South Africa have organized a South African Angora Goat Stud Book Society, to promote the pure breeding of Angora goats, by registration of purebred animals and other means.

The Imperial Ottoman government has decided to make experiments with coffee plantations in several provinces of Turkey. The Minister of Agriculture has requested the authorities of Beyrout, the soil and climate of which are considered to be fit for the cultivation of coffee, to examine the question and report upon it.

A Great Advance in Dairying.—The U. S. Cream Separator, advertised in this issue by the Vermont Farm Machine Company, has proved to be all that its manufacturers claim for it, as any one interested in the purchase of Separators can easily ascertain by sending to them for circulars, containing testimonials, and also by making inquiries of persons using them. These machines are made in five sizes, for dairy and factory use; they are simple in construction and do efficient work. Prof. Hills, the director of the Vermont experiment station, and his report of the tests made at the station, states that the analysis of the skim milk from this machine showed only five hundredths of one per cent. of fat, and that it did five per cent. more than its claimed capacity.

MORGAN SPADING HARROW. STILL GROWING. 20,000 Sold past 3 years. 49th Year.

Highest Award Columbian Exposition.

The best pulverizer. Don't confuse this tool with other rotary Harrows. It is a general purpose Harrow. Will work wherever a Harrow is needed, and where others fail. Send for circulars. Also of latest improved SPRING TOOTH HARROW.

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You can do your own repair work, and your boys can learn something of the machinists trade. Send for catalogue.

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WHOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

FUTURE OF THE WHEAT CROP.

An Agricultural Revolution Owing to Its Low Price.

PRICES MAY RECOVER 10 OR 15 CENTS—PROSPECTIVE VALUES OF THE 1894 CROP—HEAVY REDUCTION IN SPRING WHEAT PROBABLE — OTHER CROPS THAT CAN TAKE ITS PLACE TO ADVANTAGE.

Wheat sold for 55 cents per bushel at Chicago, Feb. 15, for the regular No. 2 standard grade for immediate delivery for spot cash. On the same day the same grade of wheat sold in Liverpool at a price equal to just about an even 60 cents per bushel of 60 pounds. Nor is the prospect for the immediate future at all hopeful, for on the date noted Chicago paid as low as 59 cents for wheat to be delivered in May, and the Liverpool quotation was down to 62 cents. These are the lowest prices ever known. They are 21 cents a bushel below the values current one year ago, 36 cents less than two years ago, and 37 cents under the price in February, 1891. The prices thus compare, including the average value of wheat on the farms of the United States, as reported in the preceding December:

PRICES OF WHEAT IN CENTS PER BUSHEL.

Bushels of 60 Lbs.	*Chicago.*	*Liverpool.*	*U. S. Farm.*
Feb. 15, 1894	$0.55	$0.60	$0.54
" 1893	.76	.81	.62
" 1892	.89	.97	.84
" 1891	.94	1.02	.84
" 1890	.75	.84	.70
Av. price '89	.83	.90	.70
" 1886	.77	.94	.69
" 1883	1.02	1.25	.91
Av. 1880-'89	.94	1.11	.83
Av. 1871-'79	1.11	1.54	1.05

Where the Trouble Is.

The Cause of this Decline in prices is not far to seek. It is doubtless true that this last sensational break in values is in part due to speculators who have been hammering the market for months, and by selling millions of bushels for future delivery of wheat that did not exist, have forced down prices. The existing world-wide depression in business and in all values has also been a factor in depressing wheat.

But natural causes have also been at work that would have forced a declined without these agencies, though not so severely. The enormous increase in wheat culture in the United States from 1870 to 1880, doubled our exportable surplus, and started a decline in values. Russia and India pushed wheat culture from 1880 to 1890, while the United States area of wheat was about stationary, and the decline continued. The prices in 1890 were lower than in the previous years.

The European Famine Year followed, Russia's surplus was curtailed, European wants were further enhanced by shortage in her own crops, prices advanced, and the rest of the world engaged in a mad rush into wheat culture. The United States in 1891 grew three million more acres of wheat than the previous year, Russia and India followed suit as soon as rains permitted, while Australasia and the Argentine enlarged their wheat areas as never before.

Consequently, although our American crop last year was a small one, the surplus of old wheat at home and abroad, the fair crops last year in the old wheat countries, and the big outturn in the Argentine, together with the farmer's necessities forcing him to market his wheat as early as possible,—all these influences led to a world's visible supply of 157 million bushels on July 1, '93, which increased to 190 millions on Feb. 1, '94.

The World's Market for Wheat.

The Foreign Market for Wheat—its real extent, and the degree to which the United States may hope to supply it,—these are the problems of the hour for American grain raisers.

Until within a very few years, three countries furnished the great bulk of the wheat imported by England and Eastern Europe — which comparatively small region constitutes "the world's market." The exports from these three countries have been as follows (including flour as wheat):

ANNUAL WHEAT EXPORTS (millions of bushels).

Fiscal year,	*U. S.*	*India.*	*Russia.*	*Total.*
1871- 5 av,	63	2	55	120
1876-80 av,	109	7	70	186
1880-85 av,	140	29	63	232
1886-90 av,	113	33	91	237
1891,	106	27	104	237
1892,	226	58	51	335
1893,	192	28	84	304
Fiscal y'rs end	June 30	Mar. 31	Jan. 12	

These exports for ten years 1880-1890 thus averaged about 235 million bushels a year. It is doubtful whether the net imports of England and Western Europe from other sources averaged 35 million bushels during the same time, or a total of 270 million bushels. That this is an outside estimate appears from the following table, based on averages for ten years as stated in Miscellaneous Statistical Report No. 5, U. S. Dept. of Agriculture:

IMPORT AND SURPLUS WHEAT COUNTRIES.

(In millions of bushels, exclusive of flour.)

Importing countries.	*Net Imports.*	*Exporting countries.*	*Net Exports.*
Belgium,	19.2	Austria & Hungary,	5.8
France,	37.4	Bulgaria,	5.7
Germany,	18.8	Roumania,	19.2
Greece,	8.9	Russia,	83.2
Italy,	19.9	Servia,	2.2
Norway and Sweden,	1.9	India,	30.9
Netherlands,	8.6	United States,	83.3
Portugal,	3.7	Argentine Republic,	3.7
Spain,	6.1	Canada,	2.4
Switzerland,	10.9	Chile,	3.9
United Kingdom,	105.5	Australasia,	8.2
Total,	240.9	Total,	248.7

This statement shows that the United Kingdom absorbs about 43 per cent. of the commercial supply of wheat in the grain, and that this country, with Belgium, France, Germany and Italy furnishes a market for about 83 per cent. The average net importation annually for all the countries presented above aggregates 243,000,000 bushels, and the net exports 250,000,000, leaving 7,000,000 bushels to find a market in such countries as are not reported. Flour is not included.

"The world's market" for surplus wheat is thus limited to from 250 to 300 million bushels in average seasons. This is but little more than ten per cent. of the total world's product of wheat.

The Supply for the "World's Market" in the fiscal year 1892 was 335 million bushels from the three countries of principal supply. This was 100 million bushels, or 43 per cent. more than their average. Even "famine-stricken" Russia exported 51,000,000 bushels that year, or half as much as her recent average. And in the fiscal year 1893, America, Russia and India continued to pour in an extraordinary quantity of wheat—nearly 70,000,000 bushels more than the annual average. With the stimulus also given other countries to ship wheat, is it at all surprising that the supply on hand to-day should be so large?

New Competitors in the Foreign Market are forging to the front. The Argentine has shipped nearly 40,000,000 bushels of the 1892-3 crop, and "expects" to export 60,000,000 this season. Her wheat boom has been nursed by an inflated currency, dollar wheat having been the standard there for three years, although her dollar is only worth fifty cents in gold. Just so the greater the depreciation of the Indian rupee apparently higher goes the price of wheat in India,—and the rupee is now worth in gold only about half of its face value, in spite of India's closing her mints to silver. Chile, Canada and Australia have shown, since '91, their ability to greatly increase their wheat surplus when prices warrant.

Do not all these indications show that United States wheat is likely to have even more competition in the foreign market in the future than in the past?

The Other Side of the Picture.

Has the Truth Been Told?—In other words, is the visible supply of wheat to-day as much larger than usual as to warrant the recent break in values. We have used above the data on this point collected by Bradstreets (New York) and Beerbohm (London). Both these authorities have shown great enterprise in ferreting out wheat in elevators at points not previously reported. Hence, compared with the same authorities' returns of a year previous, to-day's supply is apparently much larger because it includes so many of these new points. This plan could be carried out until the supply remaining in farm granaries was reported, but it would simply exaggerate for comparative purposes the visible at the expense of the invisible supply.

Stocks of Wheat in America. — The better method is that pursued by the Produce Exchanges in collecting weekly returns from some twenty principal points only (including Toronto and Montreal). The difference between these two methods is shown by this exhibit of the American visible supply of wheat, (exclusive of Pacific coast stocks which are now about the same as last year) in millions of bushels:

Date.	*Bradstreets.*	*Exchange.*	*Difference.*
Feb. 4, 1894,	99	80	19
Feb. 4, 1893,	111	81	30
Feb. 6, 1892,	66	43	23
Feb. 7, 1891,	40	23	17
Feb. 8, 1890,	50	31	19

According to Bradstreet's, the visible supply East of the Rocky Mountains is 12,000,000 bushels less than a year ago, while the Produce Exchange reports figure it at 9,000,000 bushels. If we take Bradstreet's reports alone, the total American visible supply (both Coasts and Canada) on Feb. 1, '94, was three million bushels *less* than a year ago and 44,000,000 bushels more than two years ago.

The Foreign Visible Supply.—With a reduced supply visible in America, upon which all authorities agree, the decline of 20 cents per bushel since a year ago, must be due to an increase in visible supplies of wheat abroad.

But Beerbohm returns the quantity of wheat in store in the United Kingdom and on the Continent and afloat for Europe, at only 10,000,000 bushels *more* than one year ago, and 8,000,000 bushels *less* than two years ago. A little more wheat is reported in Australian warehouses than a year ago, but it cuts no figure. Argentine elevator supplies are not reported at all. For all practical purposes, therefore, Beerbohm's figures for Europe and Bradstreets for America give the data needed, and permit the following comparison:

THE WORLDS' AVAILABLE STOCKS OF WHEAT.
(In round millions of bushels).

Dates.	*America.*	*Europe.*	*Total.*
Feb. 3, 1894,	108.4	74.3	183
Feb. 1, 1893,	113.6	64.3	178
Feb. 1, 1892,	72.6	82.7	155
Feb. 1, 1891,	54.9	50.1	105
Feb. 1, 1890,	55.8	49.7	105
Feb. 1, 1889,	51.8	67.6	119

The World's Visible Supply is Relatively Less than for Several Years! It is true that the figures show an increase of 5,000,000 over last year. But here is a remarkable fact: The world's available supply was on Feb. 1st only 31,000,000 million bushels more than on July 1st, last, not half as much as the gain in the like period of the two preceding years, and not even as much as the gain in ordinary seasons! Here are the figures to prove it:

GAIN IN WORLD'S AVAILABLE STOCKS.

(In round millions of bushels.)

Crop season.	*Stock on hand, July 1.*	*Feb. 1.*	*Gain in seven mos.*	**Consumption to July 1.*
1893-4,	152	183	31	?
1892-3,	99	178	79	26
1891-2,	81	155	74	56
1890-1,	69	105	36	24
1889-90,	66	105	39	36
1889-93 av,	79	138	57	33
5 years av.,	93	145	52	—

*Consumption in excess of current receipts, thus intrenching upon the supplies on hand Feb. 1 to the extent noted.

Stocks increased two and one-half times as much during the first seven months of the two previous seasons as in the present one. In ordinary seasons, the world's available stocks increase 35 to 39 million bushels during the seven months ending with January. The average increase in the previous four seasons was 57,000,000. This season the increase is only 31 millions. Does not this demonstrate that consumption is overtaking the supply?

Consumption Exceeds Receipts from February 1st to July 1st, usually. If the excess this season should be the average of the previous four years; that is, if the world consumes 33,000,000 bushels more than the new supplies that come forward, the world's available stocks July 1st next would be down to 150,000,000. This was about the supply on that date last year, when the Chicago price of wheat was 65 cents, and Liverpool 72 cents.

Exports are Falling Off, and it may be that consumption will intrench upon present reserves more than the quantity just stated. There is reason to believe that a larger proportion of the surplus of wheat has been exported than usual, as indicated by the decrease in visible supply. Yet in spite of low values, exports are less in volume than in recent boom years. From July 1 to December 30, 1893, the United States shipped 98 million bushels against 108 in the corresponding previous period; while for the first six weeks of 1894 we exported only 17 million against 20 in the like period last year, and 26 two years ago. India exported only 15,000,000 bushels in the seven months ended October 31, 1893, compared to 24,000,000 in the like period of the year before. Russia shipped 73,000,000 bushels in the first ten months

FUTURE OF THE WHEAT CROP.

of the calendar year '93, or only about seven millions a month against an average of nine millions monthly in her year of maximum exports.

Here is a decrease in exports from the three great surplus countries. Other countries have shipped so freely that their surplus must be very low. Unless invisible stocks and wheat in farmers' hands is much more than has been estimated, can it be expected that England and Europe will receive more wheat from now to July 1st next than in ordinary years? As her receipts run below the abnormal figures of the two previous seasons, prices should rise.

The New Crop of 1894 is still four months off. If it should prove a fair average throughout the world, the prospect for advance in prices for '94 above say 70 to 75 cents at Liverpool, or 65 to 70 cents at Chicago, is not flattering. It is too early to form any idea of the next crop, though we do know that it promises finely in the Southern Hemisphere. Even a comparative shortage in the Northern Hemisphere would not boom prices. Only a very material reduction of winter wheat and a large curtailment of spring wheat acreage will be likely to readjust the world's supply to the demand of average years. An extraordinary drouth, that should seriously reduce the total wheat product of America and Europe in '94, would of course help prices for the new crop.

The American Wheat Grower's Course.

Reduce the Acreage.—Even allowing for exaggerated visible supplies, and for the contingencies of unfavorable seasons and European warfare, does not the foregoing review suggest that the proper policy for the United States farmer is to reduce his wheat acreage and not try to export more than 100 million bushels a year? This should call for a reduction of 20 per cent. in the area of wheat.

In Place of Wheat the land can be devoted to a variety of purposes. Certainly with wheat at 55 to 60 cents in Chicago, or from 35 to 50 cents on the farm, we cannot afford to grow it even with machinery, so long as our average yield is only 12 bushels per acre. If prices continue on such a basis, much more money can be got out of the crop by feeding it. In fact, those farmers who have fed wheat to hogs during the past winter are the ones who have made money.

But there are other crops, such as corn, oats, rye, peas and beans that will furnish a far greater amount of feed per acre than will wheat. With our improved methods of dairying we can certainly enormously increase the production of butter and cheese, and still make dairy farming more profitable than wheat growing. Our exports of dairy products have been rapidly decreasing of late years, owing partly to the increasing exports of oleomargarine. Regulate the oleo traffic and produce more butter and cheese for export, is one thing that will pay better than wheat.

Our exports of all meat products have also been on the decline, yet Europe must be several years making up her supplies of live stock diminished by the shortage in hay and fodder crops for two years, and the foreign market should take largely increasing quantities of American meats at fair prices for several years.

Europe Consumes Far More Rye than she does wheat. This crop yields two or three bushels per acre more than wheat, commands a higher price and can be grown as cheaply. Flaxseed, barley, peas and beans can be grown for market on a large scale and even with consequent lower prices, should yield a larger profit than wheat is likely to do for the next few years.

There are many other crops of which we import large quantities that could be grown in the United States. It is especially to be regretted that the present administration proposes to take away encouragement to the sugar industry which, under a rational system, would occupy a great breadth of land with sugar cane, sorghum and sugar beets.

In Growing Wheat every possible effort must be made to keep down the cost of production per acre, while increasing the yield per acre. The future of this crop will be watched with the greatest interest during the next two or three years. Certainly its future cannot be worse than its present.

A Physician Talks.

The Remarkable Story and Affidavit of Dr. Lewis Blundin.

AFFLICTED WITH PARALYSIS FOR TWENTY-FIVE YEARS—PRONOUNCED INCURABLE BY THE FOREMOST PHYSICIANS OF THE WORLD—A CASE OF WORLD WIDE INTEREST.

(From the Philadelphia Times.)

Many survivors of our late war left the ranks unwounded but with broken constitutions; an instance in point is Lewis D. Blundin, a resident of Hulmeville, Bucks Co., Pa. In relating his experiences and what he had suffered in consequence of the hardships he had encountered Mr. Blundin said:

"I was born at Bridgewater, Penna. in 1841, and went through the war as private, sergeant and hospital steward in Company C, 28th Pennsylvania Volunteers. My service was active and while in Georgia I had an attack of typhoid fever, which left me weak and a ready victim for future disease. My kidneys were then affected and this finally developed into spinal trouble which lasted through my army service. In 1866 I was mustered out with an honorable discharge and entered the Jefferson Medical College in Philadelphia as a student. I graduated two years later with a diploma but did not practice. At that time I was living in Manayunk. One day, after I had graduated, I was lying on a sofa at my home in Manayunk, when I felt a cold sensation in my lower limbs as though the blood had suddenly left them. When I tried to move them I was horrified at the discovery that I was paralyzed from my hips to my toes. The paralysis was complete and a pin or a pinch of the flesh caused no pain. I could not move a muscle. I called in Dr. William C. Todd of Philadelphia. He made a careful and exhaustive examination of my case, sounding and testing, and finally announced that my trouble was caused by inflammation of the spinal cord, and that I would likely have another stroke of paralysis. I consulted Dr. I. W. Gross and Dr. Pancoast of Jefferson College, Philadelphia, with the same result. I called in Dr. Morehouse, of Philadelphia, who said that no amount of medicine would ever prove of the slightest benefit to me.

"One day last September I decided to try Dr. Williams' Pink Pills for Pale People. I sent for some. I had always been troubled with a sort of vertigo after my first stroke of paralysis to such an extent that when I got out of my bed my head would swim and I had difficulty in saving myself from falling. My appetite was bad, digestive organs ruined and no assimilation of food. In addition to my many other ailments, rheumatism held a prominent place. By the time I had finished the first box of Pink Pills I was comparatively free from these minor ills. Relief followed upon relief with astonishing rapidity. First one ail would disappear, then another, until the pills got to work upon the foundation stones of my trouble—paralysis. Before I had taken the six boxes of pills, I was sitting in my chair one afternoon, when I felt a curious sensation in my left foot. Upon investigation I found it had flexed, or, in other words, become movable, and I could move it. From that time on my improvement was steady and it was not long before I was walking round on crutches with little or on discomfort. It was three years before taking the Pink Pills that I had been able to use the crutches at any time. My health is daily improving and I feel sure that Pink Pills have done me more good than all the doctors and all the medicine in the country, and as they are not costly I can easily afford the treatment."

Sworn to before me this 15th day of May 1893. GEORGE HARRISON, *Not. Public.*

These pills contain in a condensed form all the elements necessary to give new life and richness to the blood, and restore shattered nerves. They are an unfailing specific for such diseases as locomotor ataxia, partial paralysis, St. Vitus dance, sciatica, rheumatism, nervous headache, the after effects of the grippe, palpitation of the heart, pale and sallow complexions, that tired feeling resulting from nervous prostration, all diseases resulting from vitiated humors in the blood. They are also a specific for troubles peculiar to females. In men they effect a radical cure in all cases arising from mental worry, overwork, or excesses of whatever nature.

These Pills are manufactured by the Dr. Williams' Medicine Company, Schenectady, N. Y., and Brockville, Ont., and are sold in boxes, at 50 cents a box, or six boxes for $2.50, and are never sold in bulk or by the dozen or hundred.

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The New Cotton Culture.

IMPROVED VARIETIES THAT YIELD TWICE AS MUCH AS ORDINARY COTTONS—EGYPTIAN COTTON.

The extraordinary increase in the importation of long staple Egyptian cotton (from 5,000,000 pounds in 1886 to seven times as much last year,) the decrease in production of our domestic long staple Sea Island cotton, and the decline in price of all grades of cotton, have set farmers to thinking. Several State experiment stations at the South have been trying to improve the varieties of cotton so as to give planters a kind that would yield more pounds of cotton per acre and of a longer staple, and that therefore would yield more profit. The United States Department of Agriculture last winter imported seed of two of the most promising Egyptian cottons—Afifi and Bamia, which were tested by the stations and by many planters last season. The AMERICAN AGRICULTURIST has made an inquiry into the present status of all these efforts, with the results printed below. Remember in reading them that 175 pounds per acre is the average yield of lint cotton in the United States.

NORTH CAROLINA.—The Egyptian cottons were tested in five localities extending from the eastern to the western portion of the cotton belt. The result in each of these cases was adverse. The yield was very much less than the ordinary varieties grown on the same land. For a longer season it is possible for them to do well, but our tests were not encouraging. One locality reports great trouble with the picking, not being able to get more than 50 pounds per day with the best hands. The lint was good, averaging about 33 per cent. of the seed cotton. Some of the improved native varieties grown at our sub-stations on plots of one-twentieth of an acre, have yielded at the rate of 940 to 1,600 pounds per acre in three pickings, of which from 28 to 34 per cent. was lint.

H. B. BATTLE, Director.

SOUTH CAROLINA.—I planted the two Egyptian cottons and 60 other varieties, including two of our Sea Island, 47 new varieties produced by artificial cross and 14 thoroughbreds. The Egyptian cannot be profitably grown here on account of their lateness and very small yield, which is inferior to our Sea Island, and the lint is but little more than half as long. I have long-staple upland varieties which produce a lint equal in length to that of the Egyptian and tenfold in quantity.

J. S. NEWMAN.

GEORGIA.—The Bamia produced at the rate of 312 pounds of seed cotton and the Afifi 403 pounds per acre, against from 1,500 to 2,300 pounds yielded by 15 native upland varieties. The stalks of the Egyptian were very tall but not branched except a few branches near the ground. The lint is long and fine, but of a dirty white color. I do not consider either as promising. We are conducting experiments in crossing and hybridizing varieties and species. R. J. REDDING, Director.

MISSISSIPPI.—We planted three lots each of Bamia and Afifi, using different soil for each lot, and giving them the best care. But the results were quite disappointing. The average yields of the six sorts was only 80 pounds of lint per acre, while American cotton on adjoining plots averaged 354 pounds. The Egyptian grew well and set good crops of bolls, but failed to mature before the plants were killed by frost, October 18. We made a large number of crosses between these Egyptian varieties and some of the early maturing American sorts, making the crosses in both directions, and shall use these seeds in planting during the coming season. We shall also repeat our plantings of both Egyptian varieties with seed taken from some of the earliest maturing stalks, though I think we are too far north to succeed with varieties originating in tropical Egypt.

S. M. TRACEY, Director.

LOUISIANA.—Previous to testing Afifi and Bamia last year, we had been cultivating for three years a variety called Metafifi imported from Egypt by our own station. These experiments were made at all three of our stations, Calhoun on the hills of North Louisiana, Baton Rouge on the bluff lands, and at Audubon Park, New Orleans, upon the alluvial bottoms of the Mississippi river. We cannot recommend this long-staple Egyptian for the hill lands of this State, but upon our alluvial soils it has done fairly well for the first season, the yields of seed cotton per acre last year having been as

[*Continued on Page* 181.]

CURES OTHERS

M. W. SCOTT, ESQ., of the U. S. Marshall's Office, *Atlanta, Ga.*, writes: "For many years my wife has been a constant sufferer from indigestion, sick headache, nervous prostration and all other complaints that the female sex is heir to, and, after trying many remedies and doctors with but little or no relief, I persuaded her to try Dr. Pierce's Favorite Prescription and 'Golden Medical Discovery.' She was so out of heart, she returned the answer that it would be like all the rest—of no good; but on my account, she said she would try it, so I got one bottle each; and before she had used half of a bottle she felt that it was benefiting her, and she has continued to improve ever since, and now thinks it the most wonderful remedy on earth for her sex, and recommends it to all suffering females. She has not been so well in ten years.

MRS. SCOTT.

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YOU CAN SAVE

Time, Labor and Money.

Used and approved by practical men in 27 states. Send for testimonials and prices.

Rochester Radiator Co.

ROCHESTER, N. Y.

The New Cotton Culture.

(*Continued from Page* 180.)

follows: Metafifi 990 pounds, 34.2 per cent. being lint cotton; Afifi 1,305 pounds, 35.5 per cent.; Bamia 1,300 pounds, 30.4 per cent.; and Sea Island 1,375 pounds, 29 per cent. lint. The Bamia produces a stalk almost straight and in the shape of an elongated sugar loaf; limbs short and midway between what we term the cluster and long-limbed cotton. We found that the Bamia could have been grown in five-foot rows one foot apart without too much crowding, instead of seven-foot rows two feet apart. Its lint is yellow, moderately long and very attractive. Afifi has a stalk with large, long limbs, will not bear so close planting and has a more extended leaf surface. The lint of this is also yellow, a desirable staple, and the yield produced is more nearly a natural maximum. Our great trouble here with Sea Island is that it grows to such an enormous height, the small per cent. of lint to seed and the difficulty of picking it, while our saw gins materially reduce the length of the staple. We consider the Bamia and Afifi as worthy of more extensive trials upon alluvial lands. These varieties have yellow blooms and their habits of growth, fruiting and maturing closely resemble Sea Island. Our Peruvian cotton has been killed for two successive years by frost without showing a boll; last year we transferred it to the hot room and it has not yet shown any sign of fruiting although 15 or 20 feet high and two years old. Upon other plots we have grown as high as 48 varieties, covering many hybrids or crosses between Gossippium herbaceum and G. Barbadense, which have yielded from 1,428 to 3,381 pounds of seed cotton, covering all lengths of staple and all proportions of lint to seed. I do not include the so-called lintless cotton, because there is no lint to this, and as the seed drops to the ground as fast as it matures, it is of no value to the practical planter, though a great curiosity.

W. C. STUBBS, Director.

ARKANSAS.—As a whole the results of tests with the Egyptian cotton at our Southern stations were satisfactory. They were scarcely affected by drouth. Different soils affected them considerably in yield. Full notes were taken and the results will be published.

R. L. BENNETT, Director.

Cauliflower on Long Island.—Geo. H. Howard, Suffolk Co., N. Y., writes us: "This is my third year with Early Perfection cauliflower, and I must give it another good report. I have cut more barrels from a given piece of land than I have ever cut before from any other kind. Nearly every plant perfected a good head, and its earliness gave me sufficient time to cut all without losing a head from frost. The bills from my commission merchant foot up 295 barrels from one and a half acres of land.

Colic Remedies.—Simon Kelso, Klamath Co., Oregon, requests remedies for colic of horses and cattle. An efficient remedy for colic is half a pint of linseed oil and two fluid ounces of laudanum, well mixed and given at a dose. A speedily acting remedy is one ounce of tincture of opium, one ounce of sulphuric ether, mixed in half a pint of molasses and water. Linseed oil half a pint, oil of turpentine one ounce, and laudanum, well mixed together and given at a dose. A reliable medicine for colic, to be kept on hand in a well stoppered bottle, is a fluid ounce of laudanum, the same of oil of turpentine, and two fluid drams of essence of ginger. Five or ten doses as above, can be kept in a bottle ready for use. This will not only save time, but also will save the lives of valuable animals.

The Carter Fence.—The fence question becomes more important as timber gets scarce. Farmers are now looking upon Woven Wire Fencing with a great deal of favor, as it uses but little lumber, is cheap, durable and substantial. The expense of making is now the great question. The Carter Wire Fence Machine Co. are at present selling a machine for $12.00 with which the farmer can weave his own fence at only 25 cents per rod, counting the wire and weaving. It will pay any one intending to fence to investigate this new machine, by addressing the Carter Wire Fence Machine Co., Derby, Ohio.

Worth Many Times Its Price.—I appreciate the AMERICAN AGRICULTURIST very much and consider it of far more financial benefit to me than many times the price of the subscription.

CHAS. M. DUTCHER, Lee Co., Ill.

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BY a new process (covered by letters patent) and thoroughly tested for two years in Canada and elsewhere. The preserving fluid is odorless, odorless and harmless (cost will not exceed half-cent per dozen for treatment) and will preserve eggs fresh and sound 6 to 9 months in any temperature. I will furnish the formula on receipt of $5.00 and agreement not to divulge the process.
FRUIT By the same formula kept fresh 2 months extra.
Address H. K. FLAGLER, P.O. box 1745, Boston.

READ THE FACTS about **FLORIDA** in our monthly newspaper, The "Florida Homeseeker," 50 cents per year. Sample free. Tells how to secure homes at $1, and up, monthly payments, in a beautiful, high, healthy, growing township amid 25 clear lakes, free from malaria, whisky, negroes and freezing. It also tells how to secure cheap and good hotel board and cheap transportation rates there. Also how to grow our staples, **Pineapples, Lemons, Oranges** and **Grapes.** Stop paying rents, fuel, heavy clothing and doctor's bills, by going to our model community. Address **The Florida Development Co., Avon Park, De Soto Co., Florida,** or **99 Franklin Street, New York.**

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Send for new catalogue. **JAMESBURG, N. J.**

STAYS hooked—turn, twist, wriggle. The DE LONG PATENT HOOK AND EYE.
See that
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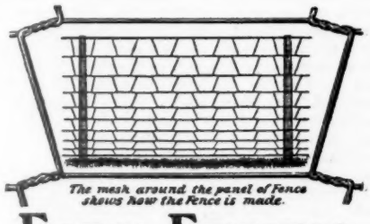

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is cheap, but still it is said to cost more money than all the buildings on the farm. Are you using the best and cheapest kind on the market? Send for Catalogue. Address
KEYSTONE WOVEN WIRE FENCE CO.
No. 100 Locust St. TREMONT, Tazewell Co., Ill.

MATTERS OF BUSINESS.

Past, Present and Future of Cotton.

Is the Crop Mostly Marketed?—The returns to the United States Department of Agriculture indicate that on February 1st only 7.8 per cent. of the cotton crop of 1893 was still in planters' hands. Commercial reports of shipments from plantations since September 1st, which are believed to be quite accurate, show that up to February 1st, 5,244,566 bales had been forwarded from plantations. This points to a crop of 5,688,000 bales, in addition to whatever old cotton may have been on plantations at the beginning of September, this last being an unknown quantity.

The American Agriculturist Estimate of the 1893 crop was between six and seven million bales, probably 6,500,000 bales (Page 582), and the best cotton exchange reports agree that the latter figure is more likely to be correct, but this Department return of a million bales under this figure shows that some one has blundered, or that an unprecedented proportion of '92 cotton has been coming forward. The total visible supply of American cotton on February 1st and also on September 1st for the four past seasons, the gain in the supply between the two dates, and the difference between this later quantity and the total receipts from plantations to February 2d (which represents roughly the cotton consumed), compare as follows, in thousands of bales, omitting the last three figures—to which is added the price per pound of middling upland at New York and Liverpool, and also of good brown Egyptian cotton at Liverpool:

Visible Supply.	1894	1893	1892	1891
Feb. 1st	4,057	3,857	4,193	2,902
Sept. 1st	1,707	2,130	1,237	598
Net gain	2,350	1,727	2,956	1,394
Consumed	2,894	2,662	3,147	4,455
Receipts from planta'ns	5,244	4,389	6,103	5,849
Price per lb.				
New York	7 1/16c	9 3/16c	7 5/16c	9 1/16c
Liverpool	4 1/16d	5 3/16d	3 13/16d	5d
Egyptian	5 1/16d	5 3/16d	5 1/16d	6 3/16d
World's Visible Supply,				
Feb. 1	4,569	3,316	4,623	3,596

The Department Returns, based on 100 as representing a full stand, make Virginia's crop 94 per cent. of a full yield, North Carolina 94, South Carolina 92, Georgia 93, Florida 106, Alabama 96, Massachusetts 104, Louisiana 90, Texas 85, Arkansas 94, Tennessee 94, Missouri 81, general average for the country 92.1. The proportion of cotton to seed ranges from 31.7 to 33 per cent., averaging 32.2. The price of cotton seed ranges from 15.6 to 19.7 cents per bushel.

Correspondents of the department assign as a cause for the unusually large proportion of the cotton marketed that the producers, owing to the stringency of the times, have been compelled to part with their holdings to pay debts and meet necessary expenses. The percentage by States is as follows: Virginia 85, North Carolina 88, South Carolina 90, Georgia 92.5, Florida 91, Alabama 93, Mississippi 92.4, Louisiana 94, Texas 92, Arkansas 94, Tennessee 92, Missouri 92. The average date at which picking occurred was December 2.

An Advance in Prices is confidently looked for by a large proportion of the trade, both at home and abroad. There is an agreement on the part of many authorities that the world will require during the current season 8,100,000 bales of American cotton, whereas the crop of '93 was probably 1,500,000 bales below this quantity. The general depression in trade, which has seriously affected the cotton mills, and the large receipts from plantation, are of course postponing the expected advance, and may prevent its realization.

But the impression is very general among all cotton statisticians that the market for the '94 crop will open at much better figures than have prevailed for two years past. Anton Hvistendahl's *Review*, the great London authority, concludes its January article as follows: "I venture to express the opinion that the conditions which led to the price of midland uplands falling below 4d per pound no longer exists. Statistically, commercially and financially, the condition has very materially improved, and for these reasons I look for an advance in the price of cotton."

Our own tabular statement above shows that the visible supply of American cotton since the opening of the trade year, has gained 600,000 bales *less* than in the corresponding period two years ago, while the consumption has been only 250,000 bales less than in that period, and greater by 232,000 bales than in the like period last year. Will our planters make the mistake of largely increasing their area of cotton, and thus causing another period of overproduction and low prices?

The Supply of Live Stock.

In January of each year the correspondents of the United States Department of Agriculture are called upon to make careful estimate of the numbers of the various classes of live stock, and farms and their value. These reports have been made up for 1894, and will soon be published by Secretary Morton.

Sheep Have Declined in numbers by nearly 2,500,000 head, or about 7½ per cent. on the number estimated by the Department to have been on hand a year ago. We believe the Department has greatly overestimated the number of sheep. The sheep on hand in June, 1890, were returned by the Eleventh Census at 35,930,000 (See Page 52, present volume), whereas they were estimated to have been 42,600,000 by the Department in January of that year. Our own judgment is that the number of sheep in the United States to-day is under 40,000,000, and that the decrease during the past twelve months has been fully three millions. The great decrease in the value of sheep—from $2.66 to only $2 per head—shows a decline of 25 per cent., and the total value is nearly $35,000,000 less than a year ago.

The Outlook for Hogs is still good, as they are yet comparatively scarce. The number is estimated at a million head less than a year ago and 7,000,000 less than two years ago. While too much reliance cannot be placed on these figures, values are better, comparatively, than of other stock. The danger is that there will be a grand rush into the hog business this year.

Milch Cows hold their own in number and value, but young stock and oxen are cheaper and slightly reduced in number. The tables for the past five years are of interest.

NUMBERS (in millions).

	1894.	1893.	1892.	1891.
Horses,	16.1	16.2	15.5	14.1
Mules,	2.4	2.3	2.3	2.4
Milch cows,	16.5	16.4	16.4	16.0
Other cattle,	36.6	35.9	37.6	36.9
Sheep,	45.0	47.3	44.9	43.4
Swine,	45.2	46.1	52.4	50.6

AVERAGE VALUES PER HEAD.

Horses,	$47.83	$61.22	$65.01	$67.00
Mules,	62.19	70.68	75.55	77.88
Milch cows,	21.77	21.73	21.40	21.62
Other cattle,	14.66	15.24	15.16	14.76
Sheep,	2.00	2.66	2.58	2.50
Swine,	5.09	6.41	4.60	4.15

TOTAL VALUE (in millons of dollars).

	1894.	1893.	1892.	1891.
Horses,	$769	$992	$1,007	$942
Mules,	146	165	175	179
Milch cows,	359	357	351	346
Other cattle,	537	548	571	544
Sheep,	91	126	116	108
Swine,	270	295	241	210

CHICAGO MARKET PRICES COMPARED.

(Per 100 pounds live weight, for standard grades.)

On February 1st.	*Cattle.*	*Sheep.*	*Hogs.*
1894	$3.10@5.75	$2.00@3.65	$3.50@5.50
1893	3.00@5.85	3.75@6.00	6.80@8.35
1892	1.50@5.95	2.50@5.25	4.20@4.55
1891	1.30@5.45	4.00@4.75	3.30@6.25
1890	1.75@5.00	3.50@5.80	3.00@4.20
1889	1.40@4.40	3.00@5.10	3.60@5.00

Personal, Commercial and Agricultural.

A New Rose.—Good & Reese Co., Box 49, Springfield, O., are introducing this season a beautiful new rose, named General Robert E. Lee, a finely colored plate of which appears in their new catalogue advertised on another page of this number.

A Salary, with expenses paid, will come handy to anyone who is now out of employment, especially where no previous experience is required to get the position. If you want a position, read advertisement on Page 180, headed "A Chance to Make Money."

The Morgan Spading Harrow.—We are informed that D. S. Morgan & Co., of Brockport, N. Y., and Chicago, Ill., manufacturers of harvesting machinery and other implements, have had phenomenal success with their pulverizers, called the Morgan Spading Harrows, having sold over twenty thousand of them the last three years.

Endorsed by the World's Fair Directors.—Of all the blood-purifiers which were offered for exhibition at the World's Fair, Ayer's Sarsaparilla was the only one accepted. In admitting this great remedy, the World's Fair directors publicly indorsed the favorable opinion which physicians and chemists have always held with regard to Ayer's Sarsaparilla.

A Farm of Fowls.—"The spirit of the times" is manifest in every detail of the establishment of C. C. Shoemaker, Freeport, Ill. Visitors who inspect Mr. Shoemaker's poultry come away marveling at its fineness and fullness. It is said that this business has trebled itself every year since he began business—a conclusive proof of the excellence of his poultry and the honor of his dealings. Mr. Shoemaker invites correspondence or a visit from all readers of the AMERICAN AGRICULTURIST.

Sixty Years of Progress.—The New York Central & Hudson River Railroad has issued a little placard that has interest. It depicts the first engine run on that line in 1831, and the best known one run on the line this year. The maximum speed of the engine three score years ago was fifteen miles an hour; that of the great engine now run is over 100 miles an hour. A unique object lesson in It is athe evolution of the locomotive is this neat little advertisement of the American railroad.

The Joseph Dixon Crucible Co., of Jersey City, has just issued a pamphlet on lubricating graphite. It embodied an elaborate scientific opinion by Prof. R. H. Thurston on the value of graphite as a lubricant, and much interesting information on the subject from practical men, and a vast amount of knowledge on the uses of graphite. This pamphlet is twice the size of that issued a year ago, and a copy will be sent free of charge to all readers of the AMERICAN AGRICULTURIST interested in the subject of friction and lubrication.

A World's Fair Calendar.—Anyone who has ever seen one of the "Keeping Everlastingly At It" calendars issued by N. W. Ayer & Son, newspaper advertising agents, Philadelphia, is ever afterward hard to please in calendars. That for 1894 is a rare ombination of beauty and utility—"a World's Fair edition" because of its numerous references to that wonderful event. Its ngenious suggestions on this subject will doubtless be helpful to many who visited "The White City." An increasing number of these calendars is sold each year. The price delivered (and well delivered), post paid to any address is twenty-five cents.

Five Hundred Square Feet, $5.00.—We take pleasure in calling attention to the advertisement of F. W. Bird & Son, of E. Walpole, Mass. The Neponset waterproof fabrics are known to be excellent covering for houses, barns, hen houses, greenhouses, and all outbuildings. They are very durable, much cheaper than shingles, and easily put on a building. This firm is now introducing a new kind of carpeting, similar to oilcloth, but possessing great wearing qualities. Mention the AMERICAN AGRICULTURIST, and send a postal to Messrs. Bird & Son, and you will receive a variety of samples free.

Selling Milk and Raising Calves.—One great paying feature on the farm is the raising of calves on a very nutritious and easily digestible meal of recognized value, and selling or otherwise utilizing the milk. Messrs. E. W. Blatchford & Co., of Chicago, this season are putting on the market a meal that they claim—and all the claims are abundantly endorsed—is a perfect milk substitute for raising calves—is nutritious and digestible enough to raise calves on without any milk—is more economical to use than milk, and is a highly recommended remedy for the "scours." From what we can learn about it we should think it well worthy of a trial.

Chickens Hatched by Steam.—The introduction of the Excelsior Incubator and its improvement from time to time, marks a new era in the poultry raising industry. Built upon the best lines, fitted with improved automatic device, to accurately regulate the temperature and the moisture as demanded by the laws of nature, it can always be relied upon. Those who are now engaged in poultry raising, and those who are studying its possibilities as a source of profit, will do well to send six cents to George H. Stahl, Quincy, Ill. for his catalogue. It contains much valuable information about incubators, brooders, and poultry raising in general.

The Improved Monitor Incubator.—This is one of the highest standard incubating machines made, and has a test of many years' experience. For the incubators made by Mr. A. F. Williams, Bristol, Conn., and known as the "Improved Monitor," it is claimed that chicks hatched by this system of incubation are much healthier and stronger than when raised by the hen. A beautiful feature of the device is the system of regulating the heat, which is by the use of a solid rod, very sensitive to the heat. The Improved Monitor has made an astonishing record for itself in competition at State Fairs and large expositions. Our readers are referred to an advertisement in this issue.

Secret of her Success.—A lady said recently:—"My fifty hens, half pullets and half year-old hens, are now, December 26, laying two dozen eggs and upward every day." But the secret of her success, she says, was in the fact that she had used more or less Sheridan's Powder every month in the year, so that the hens were in condition to lay when eggs brought the most money. Her hens and chickens are sound and healthy the year through,

MATTERS OF BUSINESS.

and she believes it largely due to Sheridan's Condition Powder. Certainly over 30 years' use ought to be ample recommendation for it. I. S. Johnson & Co., Boston, Mass., will send further particulars free to any readers of the AMERICAN AGRICULTURIST who may apply.

The Russian Government.—The Russian Government after a thorough investigation has bought and furnished their government breeding stables with the Perfect Impregnator sold by Specialty Manufacturing Company, Carrollton, Mo.

Artificial Incubation.—The chief requirements of a perfect incubator are an unfailing automatic device for keeping the temperature in the incubator the same at all times, and a perfect arrangement for supplying the proper amount of moisture to the eggs during every stage of incubation. With these two feature must be added a perfect system of ventilation. These features are prominently developed and ingeniously combined in the Improved Victor, manufactured by the George Ertel and Company, of Quincy, Ill. The Improved Victor is as near self-operating as it is possible for such an apparatus to be. It is well built of the best material, fitted with the best appliances, and attractively finished throughout. Their catalogue of incubators and brooders will be sent free to readers of the AMERICAN AGRICULTURIST.

One Man's Faith.—Mr. B. R. Bohart of Cedar Rapids, Iowa, purchased for his farm several years ago a quantity of a particularly good fence—the Page—long advertised in our columns. He was so well pleased that he secured the agency for the north half of Iowa. Mr. Bohart has decided to devote himself henceforth alone to the advancement of the Page Fence. He now offers for sale his entire herd of Red Polled cattle, and other live stock at a great sacrifice, in order to embark unincumbered on this heavy business enterprise. Mr. Bohart is not dismayed by the task before him of doubling the record of his predecessor, who sold 350 miles of Page woven wire fence in 1893, and from what we know of the popularity of the fence we have no doubt he will succeed.

A Common Sense Incubator.—Every day it becomes more and more evident that the first principle of a good hatcher is common sense, and this is claimed to be the leading feature in the Simplex Hatcher, manufactured by the Simplex Hatcher Co., Quincy, Ill. It is simple in construction, and while automatic and self-operating, there is practically nothing that can get out of order. The heating appliances, the method for keeping the temperature are uniform at all times, and the plan for supplying the precise amount of moisture required are perfect. To all the readers of the AMERICAN AGRICULTURIST who are

(*Continued on Page* 184.)

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(*Continued from Page* 183.)

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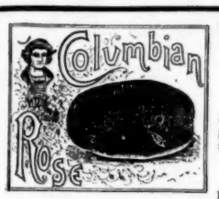

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Price ONLY $1.60, Postpaid.

With the AMERICAN AGRICULTURIST One Year, - - $2.25

Given for Two New Subscriptions at the Club Rate of $1.00 Per Year and 25 Cents Additional.

Will Keep Good Time for Ten Years.

This new watch is very similar to the Triumph which has given unbounded satisfaction and of which we have sent out thousands during the past six months, with a marked reduction in size and many minor improvements in case, finish, and movement.

It is an American watch that **will keep accurate time,** and will not get out of order. **This we guarantee,** or money refunded. The manufacturers have concentrated their entire effort on the production of this, the **cheapest reliable watch** ever given to the public, and we now stake our reputation on it and **fully guarantee it.**

The Case is strongly made and carefully fitted to exclude dust. It is **Open Face** with heavy polished bevel crystal. Case is heavily plated and handsomely finished in gilt closely resembling gold by a special process known only to the makers. Weight of watch complete 4½ oz. **The Movement** combines many patented devices, including American Lever, Lantern Pinion, Patent Escapement, Patent Winding Attachment. **Four or five turns** of winding attachment winds for 24 to 36 hours. The cut, which falls far short of doing it justice, exactly represents the watch three-fourths size.

A FEW TESTIMONIALS.

The watch I received from you keeps admirable time and compares with one **costing $50.00.**
THOS. MARTIN, Hartford, Conn.

I have received watch and am pleased to say that your praise of its real worth **was not overdrawn** in any particular. **It has kept perfect time** and the price paid for it surprises every one.
B. F. HARDMAN, Waitsburg, Washington.

I am **much pleased** with the watch you sent me. It keeps **right up on time** with the regulator. It **has not varied a minute** in two weeks.
DR. ANDERSON, Webb City, Mo.

The watch I received of you is **keeping first-rate time;** running with an expensive one **without variation.** The wonder is, how they can be made for the price.
J. S. GRANNIS, Cleveland, Ohio.

HOW TO GET IT. We will send this **Watch,** which we fully guarantee, including **chain and charm, free** as a premium to any one sending us a club of only **2** yearly subscribers to AMERICAN AGRICULTURIST. Or to such as wish to purchase outright we will send it for only **$1.50,** or with AMERICAN AGRICULTURIST **one year** for **$2.25.** Postage paid by us in each case. We can furnish the watch with Roman dial or Arabic, which style we show in cut.

No. 127.

The Franklin Fountain Pen.

Patented February 25th, 1892.

Given for Two New Subscribers.

Unsurpassed by any Fountain Pen Made.

Will not flood or leak, and one filling will answer to write several thousand words, or about 10 pages of legal cap paper. No parts to corrode, and will last a lifetime unless broken. Any ink can be used.

A well made gold pen should be smooth, and have proper elasticity, and remain so. Such a gold pen is used in this Fountain Pen, the manufacturers agreeing to replace, without charge, any pen that the iridium points come off, or that lose their elasticity with ordinary writing.

The Quality is equal to any make. The Holders are made of vulcanized Para rubber. The gold pens are those of the best makers, and are pointed with iridium, ground very carefully to give smooth points. The finish of the holders is handsome, each having an elegantly engraved design. With care this pen will last a lifetime.

The Mechanical Features are simple, there being but five parts: The barrel or reservoir, the cap, the nozzle or pen section, the feed bar and the gold pen.

GUARANTEE. Every FRANKLIN FOUNTAIN PEN is fully guaranteed to give satisfaction to the purchaser, and at any time if out of order the makers will put it in adjustment free of charge, if unbroken, and sent to them by mail, securely sealed, with name, address, and a five cent stamp for return postage.

The regular price of gold pen with fountain holder is $2.50. Our price is **$1.50,** or with the AMERICAN AGRICULTURIST one year **$2.25.**

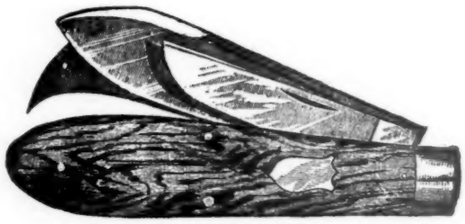
No. 400. The Levin Pruner.

Given for 2 New Subscribers.

The illustration shows the construction and action of the new superior Pruning Shears. The Pocket Knife or protected spring is a most excellent and novel feature, as this prevents breaking from twigs getting behind the spring as frequently occurs when working rapidly with the older style of pruning shears having unprotected springs. The Levin Pruner is very light, but its peculiar construction gives to it great strength; in fact as much as it is possible to get out of the best iron and steel, making the most powerful hand-shear extant. Cuts ⅝ inch dry oak. Price **$1.00,** postpaid; with the AMERICAN AGRICULTURIST one year, **$1.60.**

No. 177. "Common Sense" Pruning-Knife.

Given for 2 New Subscribers.



This common sense knife contains a pruning blade, a jackknife blade, a budding and spaying blade. Every farmer, gardener and stockman in the country should have one of these knives. The blades are carefully forged from razor-steel, file-tested, and will be replaced without extra charge if soft or flawy.

Price **$1**, postpaid, or with the AMERICAN AGRICULTURIST one year **$1.75.**

Address, THE AMERICAN AGRICULTURIST, 52 and 54 Lafayette Place, New York.

No. 123.

USEFUL PIECE OF FURNITURE FOR EVERYBODY.

$8 Combined Desk And Book Case.

Given for Only 8 New Subscriptions at the Club Rate of $1 per year.

This is a perfect desk in all its appointments. It is constructed of solid oak throughout, beautifully finished in antique and polished. The interior comprises seven pigeon holes, two compartments for letter paper, and ample room for pens, ink and other stationery. When the desk is closed it can be securely locked, thereby making the contents of the compartments private, if so desired. Also, as shown in the illustration, this elegant secretary has four roomy BOOK SHELVES, and, all in all, is one of the most useful articles of furniture a person can have in their home. The size of combined Desk and Book Case is five feet in height, two feet six inches in width, and ten and one-half inches deep.

Our Wonderful Offer.

The regular price of this Desk and Book Case is $8. Our price is **$5,** or with the AMERICAN AGRICULTURIST one year **$5.50.** Or we will give it to every person sending us **8 new subscribers,** at **$1** each. In other words, for only **$8** we will send the AMERICAN AGRICULTURIST **one year** to **eight** new subscribers, **and present** this elegant Desk and Book Case to the sender of the club. All desks are securely crated for shipment by freight, the receiver paying the freight charges, which are small.

No. 387.

Professor Moody's Celebrated Tailor System.

Specially Adapted and Indispensable for Home Dressmaking.

Given for 2 New Subscribers.

The standard system of dress-cutting of the civilized world, by which the merits of all other systems are judged. **SCIENTIFIC** in its construction, and **ARTISTIC** in execution, it stands at the head of inventions for the benefit of womankind, the home dressmaker's luxury, the modiste's necessity. This celebrated Tailor System for Cutting Ladies' and Children's Garments of every description is known and used the world over. The number of Moody Tailor System in actual daily use is greater than the number of all other systems combined, and the number sold daily exceeds the number sold of all other systems combined.

THE MOODY TAILOR SYSTEM

teaches how to cut and make ladies' and children's garments, at the same time enabling you to make all variations of the same garment, from the plainest to the most elaborately finished. Complete instructions are sent with each System. Any girl 14 years of age can learn to use the Moody Tailor System with perfect success, for the instructions are made so plain you have only to follow them to be certain that the garment will be a perfect fit without trying on. Every calculation needed will be found in the table of calculations, giving proper width of the waist line for each piece of the garment, width at bottom, size of darts, etc., for each and every measure from the largest lady to the smallest child.

ANY LADY, WHETHER RICH OR POOR, OLD OR YOUNG, CANNOT AFFORD TO MISS THIS OFFER

We are determined to give our patrons the best there is in the market, and have at great expense contracted with the Moody company, the sole owners of the copyrights and manufacturers of the celebrated Moody Tailor System, for a large number of their Tailor System complete with their books on dressmaking.

This system retails for $5.50, and the book on dressmaking at $2.50, and is considered cheap at that price. See what we offer. By special arrangements we are enabled to offer this whole outfit, including book, for the very low price of **$1.75** postpaid, and with each one purchased include a year's subscription to the AMERICAN AGRICULTURIST. Given for only 2 new subscribers.

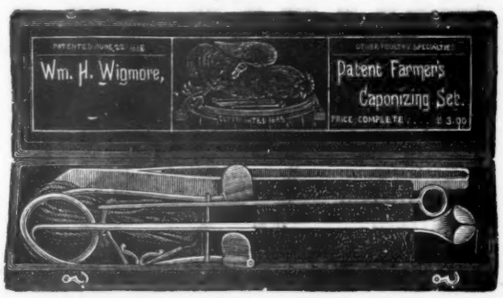
No. 18. Caponizing Set.

Given for 4 New Subscribers, or for 2 New Subscribers and $1 Additional.

The art of caponizing is comparatively very little known in this country; the operation, however, is quite simple, and in France and Italy is frequently performed by mere children.

The set here offered is especially invented to enable farmers and poultry raisers to do their own caponizing.

The advantages of capons are, much larger fowls, sweeter and finer meat, and will



pay one hundred per cent. more than ordinary fowls. They will rear and care for many more young chicks, from an incubator or hen, than a hen will, on account of their large size. They like the young chicks' company, neither hens or cocks having any use for them. The hen after bringing out a brood, if fed for a few days and then let run with the flock will lay again.

No farmer who raises poultry can afford to be without it.

The set, which consists of one fine steel knife and forceps; one nickel-plated spreader, both well adapted for the purpose; an improved German-silver cutting and twisting scoop, with fine hook on opposite end; one German silver probe, and four German silver hooks attached to cords for quickly securing the fowls; all in a fine velvet lined case, with a PRACTICAL CAPONIZING instruction book sent by mail on receipt of price, **$3,** or with the AMERICAN AGRICULTURIST one year for **$3.50.**

Address, THE AMERICAN AGRICULTURIST, 52 and 54 Lafayette Place, New York.

QUALITY IS THE BEST ADVERTISEMENT

TRADE MARK

BLATCHFORD'S ROYAL CALF MEAL,

The perfect **Milk Substitute** for calves, invaluable for all young stock.
You can sell your Milk and yet Raise Fine Calves.

MYER'S ROYAL HORSE AND CATTLE SPICE.
An Unequalled, Appetizing Tonic, Invigorating Food Seasoning.

J. W. BARWELL & CO., Ag'ts & Jobbers of Mill Feeds, Chicago, Ill.

REID'S PEERLESS CREAMERY BUTTER WORKER.

Absolute Perfection for best quality Butter
Also **Churns, Power Butter Workers, Printers, Shipping Boxes,** and

CREAMERY SUPPLIES.

Our new **Milk Cooler** and **Aerator** is the best. Send for new illustrated Catalogue of **Creamery Plan** and valuable information for Creamery men.

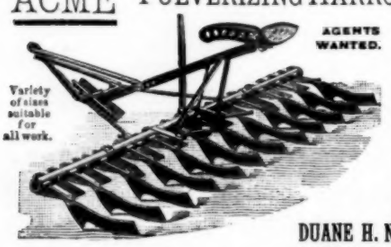
A. H. REID, 30th & Market Sts., Philadelphia, Pa.

A Day's Work

On the farm used to mean fifteen long hours. Now-a-days, with the ***PLANET JR. Labor Saving Farm Tools,*** a farmer can do as much work in less than half the time, and do it better—have plenty of time left for other things. The ***PLANET JR.*** Book for 1894 tells you just how it's done. It places you 20 years in advance of old-time methods. Tells you the secret by which others have become successful. If you are working for profit, you can't afford to do without this book. We send it free.

S. L. ALLEN & CO., 1107 Market St., Philada.

"ACME" PULVERIZING HARROW, CLOD CRUSHER AND LEVELER



IS adapted to all soils and all work for which a Harrow is needed.

Flat crushing spurs pulverize lumps, level and smooth the ground, while at the same time curved coulters cultivate, lift and turn the entire surface of the soil. The backward slant of the coulters prevents tearing up rubbish and reduces the draft.

Made entirely of cast steel and wrought iron and therefore **practically indestructible.**

CHEAPEST RIDING HARROW ON EARTH—sells for about the same as an ordinary drag—**eight dollars** and upwards.

N. B.—I deliver free on board at distributing points.

SENT ON TRIAL To responsible farmers, to be returned at my expense if not satisfactory.

DUANE H. NASH, Sole Mfr., Millington, - New Jersey. & 30 So. Canal St., Chicago.

MENTION THIS PAPER.

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Plants Corn, Beans, Ensilage, Distributes Fertilizer.

6 to 8 Acres Planted Per Day, in one Operation. Absolutely Guaranteed.

Catalogue of potato and corn planting machinery *Free.* Address
ASPINWALL MANUFACTURING CO., Jackson, Mich., U. S. A

$17 SPRAY PUMP Complete, Express paid, for **$5.50.** **60,000** —IN USE—

AUTOMATIC MIXER. BARREL ATTACHMENT.

Endorsed by the leading Entomologists of the U. S. A valuable illus. Book (worth $5.00) given to each purchaser. **SATISFACTION GUARANTEED or Money Refunded.** Illus. Book on Spraying **Free.** Rapid sellers. One Agent has already sold over 2,000. For full particulars and terms, address

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